

# *Natural Disasters Intensity Analysis and Classification using Artificial Intelligence*

**Team ID:PNT2022TMID29513**

## **TEAM MEMBERS:**

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# Project Report Form

## 1. INTRODUCTION

Increases the number of natural disasters. Populations in underdeveloped countries cannot afford damages disasters cause to Natural disasters are inevitable, and the occurrence of disasters drastically affects the economy, ecosystem and human life. Buildings collapse, ailments spread and sometimes natural disasters such as tsunamis, earthquakes, and forest fires can devastate nations. When earthquakes occur, millions of buildings collapse due to seismological effects [1]. Many machine learning approaches have been used for wildfire predictions since the 1990s. A recent study used a machine learning approach in Italy. This study used the random forest technique for susceptibility mapping of wildfire [2]. Floods are the most devastating natural disaster, damaging properties, human lives and infrastructures. To map flood susceptibility, an assembled machine learning technique based on random forest (RF), random subspace (RS) and support vector machine (SVM) was used [3]. As the population is growing rapidly, people need to acquire land to live on, and as a result the ecosystem is disturbed horrifically, which causes global warming and infrastructures. Disasters such as forest fires spread rapidly in dense areas, so firefighting is difficult to carry out; in this case, development of the strategy to predict such circumstances is crucial so that such disasters can be prevented beforehand.

## **1.1 PROJECT OVERVIEW**

Natural disasters not only disturb the human ecological system but also destroy the properties and critical infrastructures of human societies and even lead to permanent change in the ecosystem. Disaster can be caused by naturally occurring events such as earthquakes, cyclones, floods, and wildfires. To tackle this problem, we developed a multilayered deep convolutional neural network model that classifies the natural disaster and tells the intensity of disaster of natural. The model uses an integrated webcam to capture the video frame and the video frame is compared with the Pre-trained model and the type of disaster is identified and showcased on the OpenCV window.

## **1.2 PURPOSE**

Artificial intelligence (AI), in particular machine learning (ML), is playing an increasingly important role in natural disaster from the forecasting of extreme events and the development of hazard maps to the detection of events in real time, the provision of situational awareness and decision supported.

## 2. LITERATURE SURVEY

SNO	TITLE OF THE PAPER	DETIALS OF THE PAPER	OBJECTIVE	METHODOLOGY USED	TAKE AWAY
1.	Land Surface Temperature retrieval using HJ-1B/IRS data and analysis of its effect	2013 IEEE	To monitor pollution, ecosystem destruction and natural disaster on large-scale dynamically and around the clock	Generalized signal and channel alogrithm and parameter acquistion	In this paper, the generalized single-channel algorithm is utilized to achieve the LST from HJ-1B/IRS.
2.	Study on Risk assessment model of urban Drought in Hilly Area of Central Sichuan Basin	2009 IEEE	It represents a model of risk assessment of urban drought which integrates hazard, exposure, vulnerability and emergency response and recovery capability	Three methods are : Natural disaster index method Weighted comprehensive evaluation method Analytic Hierarchy Process	In this paper it is used for mathematical model for the drought risk assessment and then use this model to calculate the intensity of drought risk of Nanchong city in Hilly Area of Central Sichuan Basin from different perspective.
3.	Urban Damage Detection Using Decorrelation of SAR Interferometric Data	2002 IEEE	It indicates a fact that the building damage causes the interferometric decorrelation.	It can be detected using interferometric decorrelation of ERS and JERS-1 SAR data.	In this paper, we progress in the study for quantitative discussion of the degree of decorrelation and the

					case of JERS-1 SAR interferometric data pairs to detect the damaged area by the earthquakes.
4.	Quantifying change after natural disasters to estimate infrastructure damage with mobile phone data	2018 IEEE	It indicates that how mobility patterns are changing, in the post disaster time-frame, is crucial in order to settle rescue centers and send help to the most affected areas	In this section,we describe the approach taken to work with aggregated CDR data	In this paper,we analyzed the relationship between the reach score changes and the damage index of the earthquake in urban areas, and it showed that the correlation was negative on the day after the natural disaster
5.	Spatio-Temporal Analysis for Understanding the Traffic Demand After the 2016 Kumamoto Earthquake Using Mobile Usage Data	2018 IEEE	It mainly focuses on the effect of natural disasters on the population density transition	Analytical procedure and Spatial statistic methods are used.	In this paper ,we analysis that by using the scliCA and regression analysis captures the major travel demand patterns using the population density before the earthquake.
6.	Degree of network damage: A measurement for intensity of network damage	2014 IEEE	To define degree of network damage (DND), a measurement used to classify the effect of a destructive event on network infrastructures, human, and traffic flows	A five-scale degree of network damage is developed to indicate the impact of disaster events on networks. We combine two network metrics to determine the degree of network damage from the perspective of an ISP.	In this paper, we focus on a practical problem of providing an uniform criterion for accessing the impact of disasters on the network.

## **2.1 EXISTING PROBLEM**

*Climate change and accompanying natural disasters have created a large migrant population, called climate refugees or environmental migrants. These people can be forced out of their homes by an abrupt natural disaster, like a tsunami, or a slower-moving natural disaster, like a relentless drought. In any case, the area where they formerly lived is no longer habitable for one reason or another, or the standard of living has dropped so drastically that the uncertain future of migration looks more promising.*

## **2.2 REFERENCES**

*1.Australian Institute of Criminology. (2009). "The number of fires and who lights them." Bushfire arson bulletin no. 59, (Mar. 26, 2013)*

*2.De Boer, J. (1990). "Definition and classification of disasters: Introduction of a disaster severity scale." The Journal of Emergency Medicine, 8(5), 591–595*

## **2.3 PROBLEM STATEMENT DEFINITION**

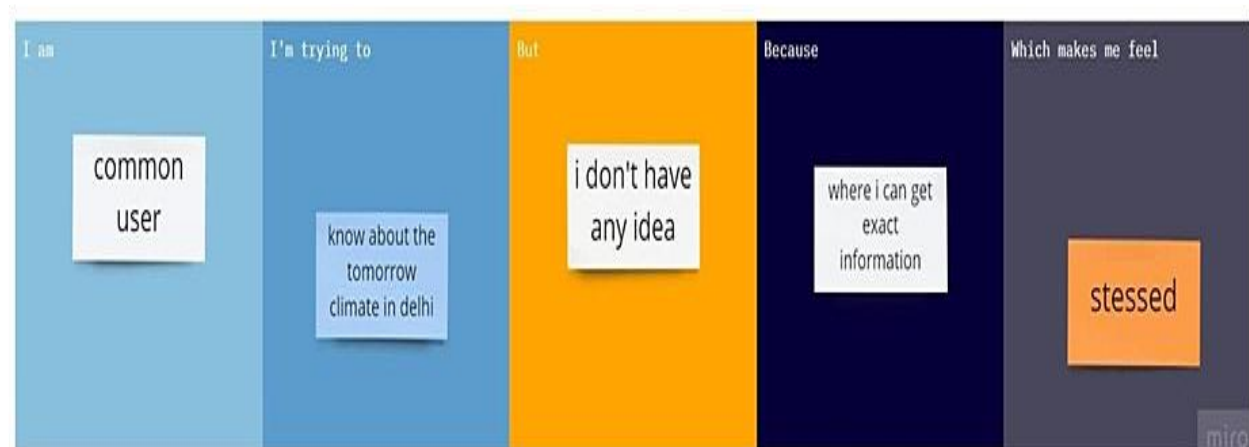
*Customer Problem Statement Template:*

*Create a problem statement to understand your customer's point of view. The Customer Problem Statement template helps you focus on what matters to create experiences people will love. A well-articulated customer problem statement allows you and your team to find the ideal solution for the challenges your customers face. Throughout the process, you'll also be able to empathize with your customers, which helps you better understand how they perceive your product or*

service.

<b>I am</b>	Describe customer with 3-4 key characteristics - <i>who are they?</i>	Describe the customer and their attributes here
<b>I'm trying to</b>	List their outcome or "job" the core about - <i>what are they trying to achieve?</i>	List the thing they are trying to achieve here
<b>but</b>	Describe what problems or barriers stand in the way - <i>what bothers them most?</i>	Describe the problems or barriers that get in the way here
<b>because</b>	Enter the "root cause" of why the problem or barrier exists - <i>what needs to be solved?</i>	Describe the reason the problems or barriers exist
<b>which makes me feel</b>	Describe the emotions from the customer's point of view - <i>how does it impact them emotionally?</i>	Describe the emotions the result from experiencing the problems or barriers

Example:

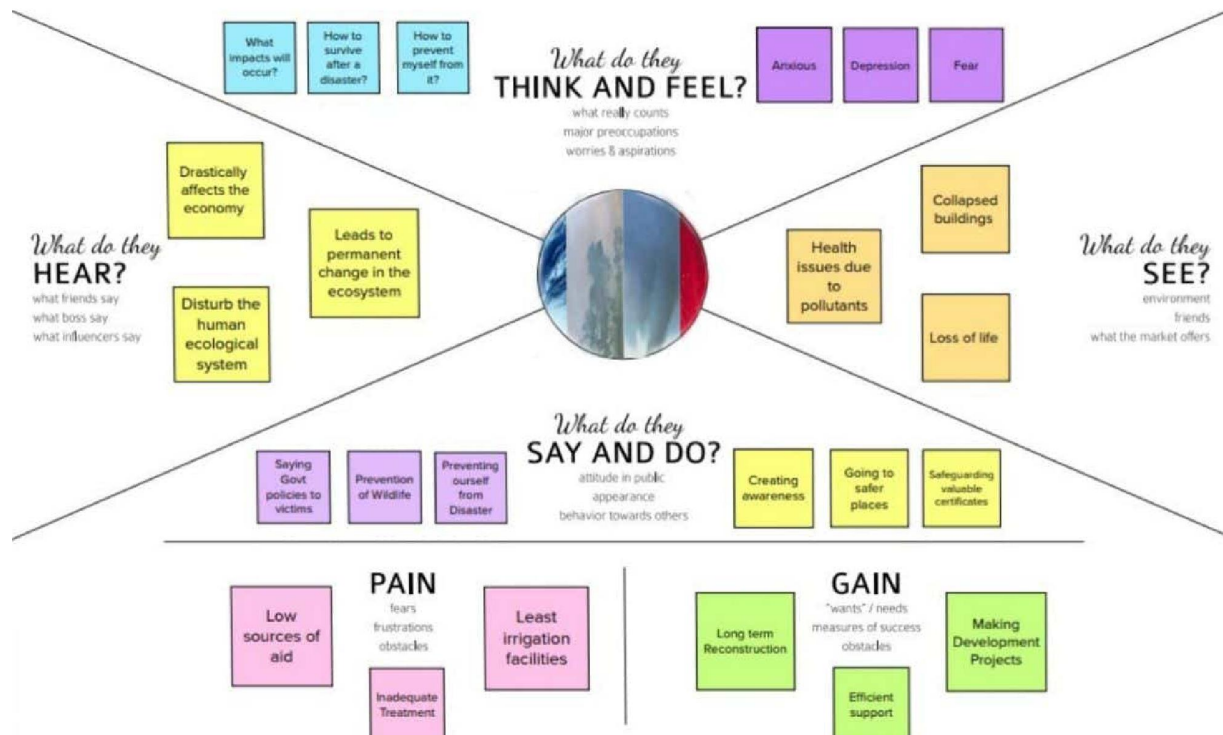


Problem Statemen t (PS)	I am (Custome r)	I'm trying to	But	Because	Which makesme feel
PS-1	Commo n man	Understand the daily weather changes in a areas	I don't know have a correct guidanc e	I don't have much idea	stressed
PS-2	Student	Get a full weatherrepo rt in a particular area	I don't aware of some website s	I can't get such details	Frustrated



### 3. IDEATION AND PROPOSED SOLUTION

#### 3.1 EMPATHY MAP CANVAS



#### 3.2 Ideation and brainstorming

Brainstorming provides a free and open environment that encourages everyone within a team to participate in the creative thinking process that leads to problem solving. Prioritizing volume over value, out-of-the-box ideas are welcome and built upon, and all participants are encouraged to collaborate, helping each other develop a rich amount of creative solutions.

Use this template in your own brainstorming sessions so your team can unleash their imagination and start shaping concepts even if you're not sitting in the same room.

Brainstorm & Idea Prioritization for “Natural Disaster Intensity Analysis and Classification Using Artificial Intelligence”:

Reference: <https://tinyurl.com/muralbrainstorm>

## Step-1: Team Gathering, Collaboration and Select the Problem Statement

Template



# Brainstorm & idea prioritization

Use this template in your own brainstorming sessions so your team can unleash their imagination and start shaping concepts even if you're not sitting in the same room.

 10 minutes to prepare

 1 hour to collaborate

 2-8 people recommended



### Before you collaborate

A little bit of preparation goes a long way with this session. Here's what you need to do to get going.

 10 minutes

 **Team gathering**

Define who should participate in the session and send an invite. Share relevant information or pre-work ahead.

 **Set the goal**

Think about the problem you'll be focusing on solving in the brainstorming session.

 **Learn how to use the facilitation tools**

Use the Facilitation Superpowers to run a happy and productive session.

[Open article](#) →



### Define your problem statement

To classify the natural disaster based on the live image given as input by using Deep Learning.

 5 minutes

PROBLEM

How might we tackle the problem of classifying the natural disaster?



### Key rules of brainstorming

To run an smooth and productive session

 Stay in topic.

 Encourage wild ideas.

 Defer judgment.

 Listen to others.

 Go for volume.

 If possible, be visual.

## Step-2: Brainstorm, Idea Listing and Groupin.

2

### Brainstorm

Ideas related to the classification of natural disaster

🕒 10 minutes

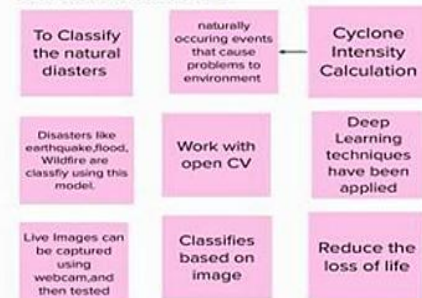
#### TIP

You can select a sticky note and hit the pencil (switch to sketch) icon to start drawing!

#### CHANDRU



#### JAYASWARNARAJ



#### SHAMFARINFAYAZ



#### ASRAR



3

### Group ideas

Take turns sharing your ideas while clustering similar or related notes as you go. In the last 10 minutes, give each cluster a sentence-like label. If a cluster is bigger than six sticky notes, try and see if you and break it up into smaller sub-groups.

🕒 20 minutes

#### TIP

Add customizable tags to sticky notes to make it easier to find, browse, organize, and categorize important ideas as themes within your mural.

### Technical Aspects

A large dataset is needed for the accurate model.

Create a user friendly GUI that helps classify the natural disaster.

### Social Impacts

Reduce the loss of life

Earlier precaution measures

### Availability of resources

Image data needed for classification

Enormous data is needed for classifying the image data.

### People emotions

People emotions on drastic disasters

People emotions on their beloved families who lost their lives.

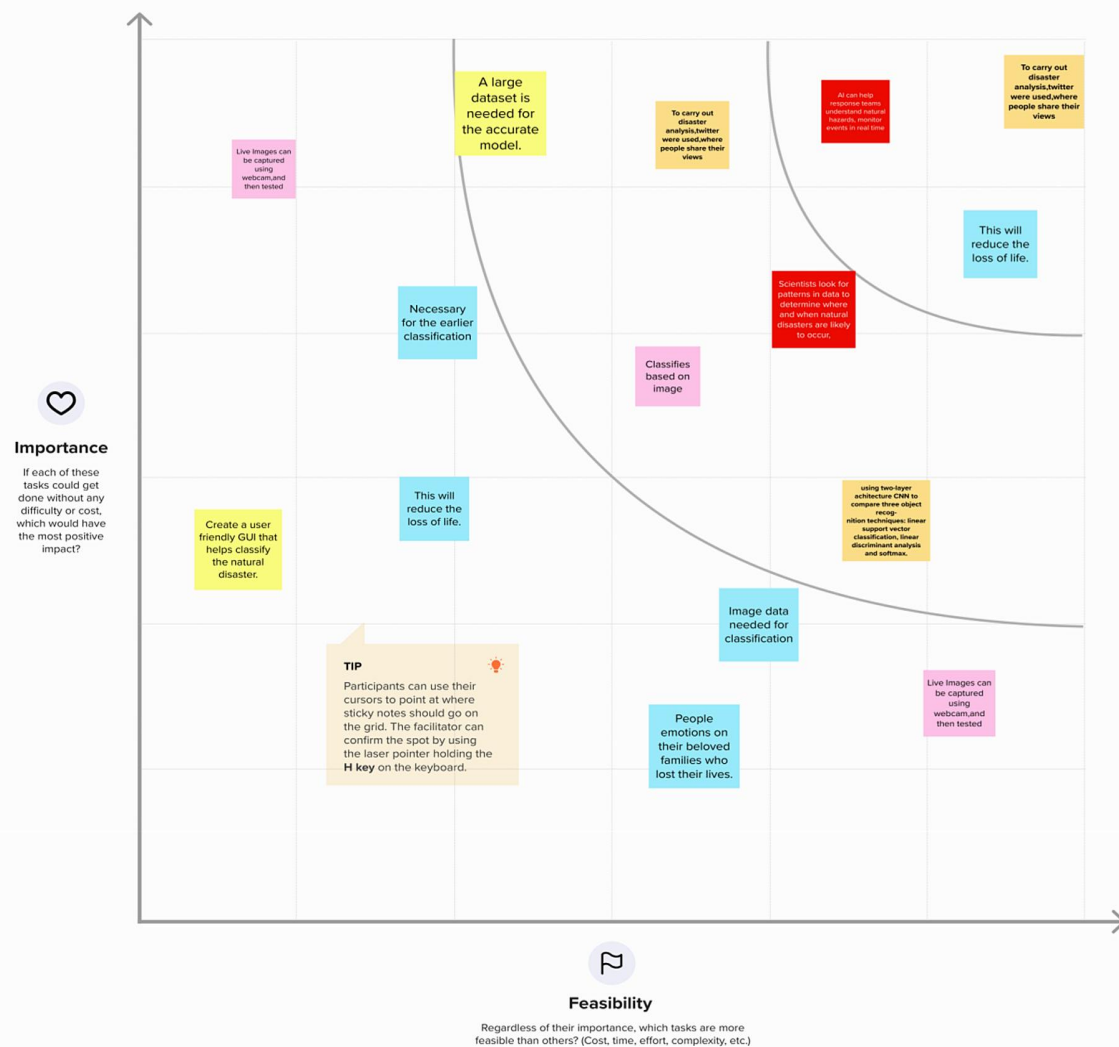
## Step-3: Idea Prioritization

4

### Prioritize

Your team should all be on the same page about what's important moving forward. Place your ideas on this grid to determine which ideas are important and which are feasible.

⌚ 20 minutes



### 3.3 PROPOSED SOLUTION

Project team shall fill the following information in proposed solution template.

S.No	Parameter	Description
1.	Problem Statement (Problem to be solved)	The main purpose of this model is to detect and classify the type of disaster with a high accuracy rate.
2.	Idea / Solution description	Emergency measures, Investments in risk reduction, Information sharing on newest research findings, Reforestation, Stable buildings, Education, Technology, Governance.
3.	Novelty / Uniqueness	A natural disaster is "the negative impact following an actual occurrence of natural hazard in the event that it significantly harms a community".

4.	<i>Social Impact/ Customer Satisfaction</i>	<i>Increased mental health issues, alcohol misuse, domestic violence, chronic disease and short term unemployment have resulted from extreme weather events such as bushfires, severe storms, cyclones, floods and earthquakes.</i>
5.	<i>Business Model(Revenue Model)</i>	<i>Be Aware of the Natural Disasters that Could Affect Your Business, Create a Disaster Response Plan, Implement Communication Plans, Backup Documents and Data, Protect the Power, Plan to Recover, Review Your Commercial Insurance Coverage.</i>
6.	<i>Scalability of the Solution</i>	<i>Scalability: Implementing disaster recovery measures involves identifying new and scalable solutions, such as the cloud.</i>



### 3.4 PROBLEM SOLUTION FIT

Project Title: Natural Disasters Intensity Analysis and Classification using AI

Project Design Phase-I - Solution Fit

Team ID: PNT2022TMD29513

Define CS, fit into CC	<div>1. CUSTOMER SEGMENT(S)<div>CS</div></div> <div>The global GIS in disaster management market size stood at \$2.3 billion in 2019, and it is expected to reach \$9.4 billion by 2030, exhibiting a CAGR of 13.7% during the forecast period (2020–2030). The major factors supporting the growth of the industry include the surging number of natural disasters, strong focus of government and emergency management organizations on adopting advanced GIS solutions, high need for analyzing geospatial data, and increasing public awareness about reducing the socioeconomic impact of natural disasters.</div>	<div>6. CUSTOMER CONSTRAINTS<div>CC</div></div> <div>Awareness, education, preparedness, and prediction and warning systems can reduce the disruptive impacts of a natural disaster on communities. Mitigation measures such as adoption of zoning, land-use practices, and building codes are needed, however, to prevent or reduce actual damage from hazards.</div>	<div>5. AVAILABLE SOLUTIONS<div>AS</div></div> <div>Planning to warn the people which will minimize the effects of disasters .Recovery and reconstruction.</div>	Explore AS, differentiate
	<div>2. JOBS-TO-BE-DONE / PROBLEMS<div>J&amp;P</div></div> <div>Which jobs-to-be-done (or problems) do you address for your customers? There could be more than one; explore different sides.</div> <div>Natural disasters can cause great damage on the environment, property, wildlife and human health. These events may include . earthquakes, floods, hurricanes, tornadoes, tsunamis, landslides, wildfires, volcanic eruptions,extreme temperatures. Property damage. Structural damage to buildings. Loss of utilities like electricity and water</div>	<div>9. PROBLEM ROOT CAUSE<div>RC</div></div> <div>What is the real reason that this problem exists? What is the back story behind the need to do this job? i.e. customers have to do it because of the change in regulations.</div> <div>The lack of resources and capacities (e.g., financial, human and technical) and a low level of knowledge an education emerged in all case studies as major root causes for several drivers of disaster risk.</div>	<div>7. BEHAVIOUR<div>BE</div></div> <div>What does your customer do to address the problem and get the job done? i.e. directly related: find the right solar panel installer, calculate usage and benefits; indirectly associated: customers spend free time on volunteering work (i.e. Greenpeace)</div> <div>Analysis of public behavior plays an important role in crisis management, disaster response, and evacuation planning. Unfortunately, collecting relevant data can be costly and finding meaningful information for analysis is challenging. A growing number of Location-based Social Network services provides time-stamped, geo-located data that opens new opportunities and solutions to a wide range of challenges.</div>	
Focus on J&P, tap into BE, understand RC	<div>3. TRIGGERS<div>TR</div></div> <div>Large economic losts, reduced accumulation of capital and infrastructure, long recovery period after disasters.</div>	<div>10. YOUR SOLUTION<div>SL</div></div> <div>Natural disasters cannot be prevented but they can be detected. We can measure disaster risk by analysing trends of, for instance, previous disaster losses. These trends can help us to gauge whether disaster risk reduction is being effective. We can also estimate future losses by conducting a risk assessment.</div>	<div>8.CHANNELS of BEHAVIOUR<div>CH</div></div> <div>8.1 ONLINE We demonstrate how to improve investigation by analyzing the extracted public behavior responses from social media before, during and after natural disasters, such as hurricanes and tornadoes. 8.2 OFFLINE Dissemination of information from nearby Government agencies and NGO'S.</div>	Identify strong TR & EM
	<div>4. EMOTIONS: BEFORE / AFTER<div>EM</div></div> <div>Before the disaster, a positive association was found between place-identity and wellbeing, indicating that the stronger emotions participants evolved to the place, as well as remembered more and thought about the place, the stronger wellbeing they experienced at the site. After the disaster, the strength of this relationship decreased more than twice, accounted for by the weakening of the emotion-wellbeing link</div>			

## 4. Requirement analysis

### 4.1 FUNCTIONAL REQUIREMENT

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	Request Permission	Access permission from web camera.
FR-2	DisasterPrediction	Based on the webcam image, natural disaster is classified.
FR-3	Accuracy	Since the training and testing images are huge, the accuracy is higher.
FR-4	Speed	The generation of results from the input images are faster.

<b>FR-5</b>	<i>Resolution</i>	<p>The resolution of the integrated web camera should be high enough to capture the video frames.</p>
<b>FR-6</b>	<i>User Interface</i>	<p>Maximizing the interaction in Web Designing Service.</p>

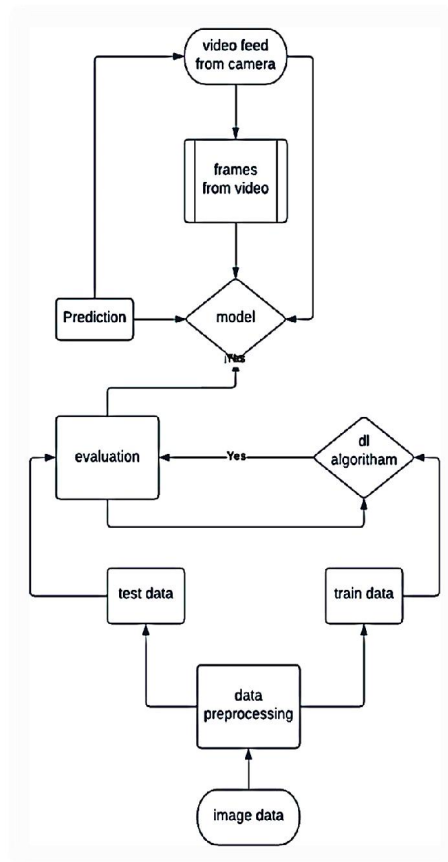
## NON FUNCTIONAL REQUIREMENT

<b>FR No.</b>	<b>Non- Functional Requirement</b>	<b>Description</b>
<b>NFR- 1</b>	Usability	User friendly and classify the disaster easily.
<b>NFR- 2</b>	Security	The model is secure due to the cloud deployment models and also there is no login issue.
<b>NFR- 3</b>	Reliability	Accurate prediction of the natural disaster and the website can also be fault tolerant.
<b>NFR- 4</b>	Performance	It is shown that the model gives almost 90 percent accuracy after continuous training.

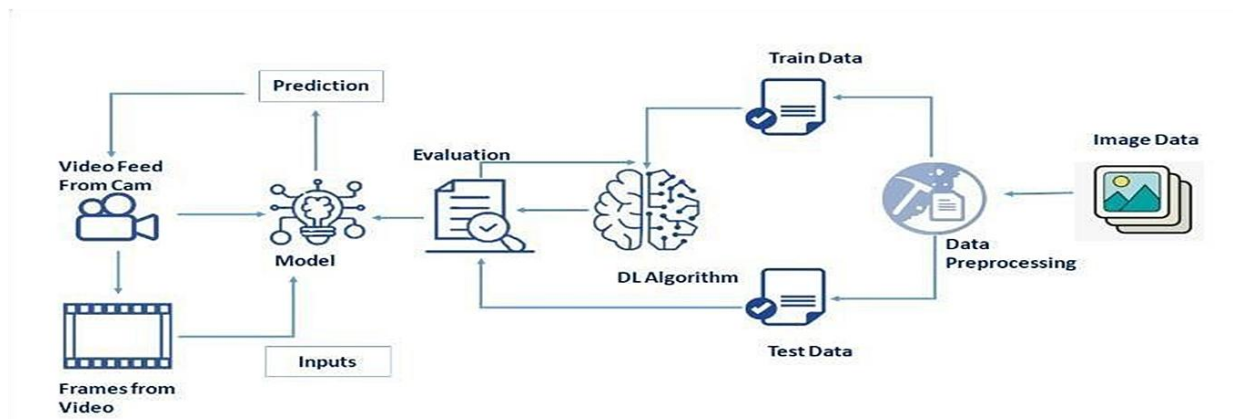
NFR-5	Availability	The website will be made available for 24 hours.
NFR-6	Scalability	The website can run on web browsers like Google chrome, Microsoft edge and also it can be extended to the NDRF and customers.

## 5. PROJECT DESIGN

### 5.1 DATA FLOW DIAGRAM



## 5.2 TECHNICAL ARCHITECTURE



### COMPONENTS & TECHNOLOGIES:

S. No	Component	Description	Technology
1.	User Interface	User interacts with application for the prediction of Any Natural disaster which will happen in future minutes.	HTML, CSS, JavaScript, Django, Python.
2.	Feature Engineering Pipeline	Algorithms can't make sense of raw data. We have to select, transform, combine, and otherwise prepare our data so the algorithm can find useful patterns.	Image processing, pattern extraction, etc.
3.	Model Training kit	It learns patterns from the data. Then they use these patterns to perform particular tasks.	Multiclass Classification Model, Regression Model, etc.
4.	Prediction unit	This function is used to predict outcomes from the new trained data to perform new tasks and solve new problems.	Decision trees, Regression, Neural networks.
5.	Evaluation system	It monitors that how Algorithm performs on data as well as during training.	Chi-Square, Confusion Matrix, etc.
6.	Interactive services	To interact with our model and give it problems to solve. Usually this takes the form of an API, a user interface, or a command-line interface.	Application programming interface, etc.
7.	Data collection unit	Data is only useful if it's accessible, so it needs to be stored ideally in a consistent structure and conveniently in one place.	IBM Cloud, SQL Server.
8.	Data generation system	Every machine learning application lives off data. That data has to come from somewhere. Usually, it's generated by one of your core business functions.	Synthetic data generation.

9.	Databasemanagemen t system	An organized collection of data storedin database, so that it can be easily accessed and managed.	MySQL, DynamoDB etc.
10.	IBM Cloud services	Processed data stored in cloud service which can be access by the admin anywhere over the internet.	IBM Cloud etc.

### 5.3 User stories

Use the below templateto list all the user stories for the product.

User Type	Functional Requirement (Epic)	User Story Number	User Story/ Task	Acceptance criteria	Priori ty	Release
Customer	Installation	USN-1	As a user, I can install this where the disaster occur	I can do it by myself	High	Sprint-1
Customer	Power connection	USN-2	As a user, I wantensure power supplyfor alldevices	I will ensureit	High	Sprint-2
Customer	Safety	USN-3	As a user, I wantto ensure that the device should be in safestplace which coversthmaximum area	I will ensurethat	High	Sprint-3
Customer	Battery backup	USN-4	As a user, I want checkthe batter backup toprevent it from power loss	I can assurethat	High	Sprint-4
Customer	internet connectivity	USN-5	As a user, I want to check the internet connectivity	I will ensure that	High	Sprint-5

## 6. PROJECT PLANNING AND SCHEDULING

### 6.1 SPRINT PLANING AND ESTIMATION

Use the below template to create poduct backlog and sprint schedule

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint -1	Registration	USN-1	As a user, I can register for the application by entering my email, password, and confirming my password.	2	High	Chandru
Sprint -1		USN-2	As a user, I will receive confirmation email oncel have registered for the application	1	High	Jayaswarnara j
Sprint -2		USN-3	As a user, I can register for the application	2	Low	Shamfarinp ayaz



			through Facebook			
Sprint-2		USN-4	As a user, I can register for the application through Gmail	2	Medium	Asrar
Sprint-1	Login	USN-5	As a user, I can log into the application by entering email & password	1	High	Chandru
Sprint-1	Dashboard	USN-6	As a user, I can access the services and information provided in the dashboard	2	High	Jayaswarnaraj
Sprint-1	login	USN-7	As a user, I can log into the web application and access the dashboard	2	High	Shamfarinpayaz
Sprint-4	Helpdesk	USN-8	As a user, I can get the guidance from the customer care	1	High	Asrar

Sprint	Functional Requirement (Epic)	User Story Number	User Story/ Task	Story Points	Priority	Team Members
Sprint -3	Management	USN-9	As an administrator, I can collect new datasets and keep the model trained	2	High	Chandru
Sprint -3		USN-10	As an administrator, I can update other features of the application	2	Medium	Jayaswarnaraj
Sprint -3		USN-11	As an administrator, I can maintain the information about the user	2	Medium	Shamfarinpayaz
Sprint -4		USN-12	As an administrator, I can maintain third-party services	1	Low	Asrar

Project Tracker, Velocity & Burndown Chart:

Sprint	Total Story Points	Duration	Sprint Start Date	Sprint End Date (Planned)	Story Points Completed (as on Planned End)	Sprint Release Date (Actual)
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					Date)	
Sprint-1	8	6 Days	26 Oct 2022	31 Oct 2022	8	29 Oct 2022
Sprint-2	4	6 Days	1 Oct 2022	05 Nov 2022	4	05 Nov 2022
Sprint-3	6	6 Days	6 Nov 2022	10 Nov 2022	6	12 Nov 2022
Sprint-4	2	6 Days	10 Nov 2022	13 Nov 2022	2	19 Nov 2022

### Velocity:

Imagine we have a 10-daysprint duration, and the velocityof the team is 20 (points per sprint). Let's calculate the team's average velocity (AV) per iterationunit (story points per day)

$$AV = \frac{\text{sprint duration}}{\text{velocity}} = \frac{20}{10} = 2$$

$$AV (\text{Sprint } 1) = 8/6 = 1$$

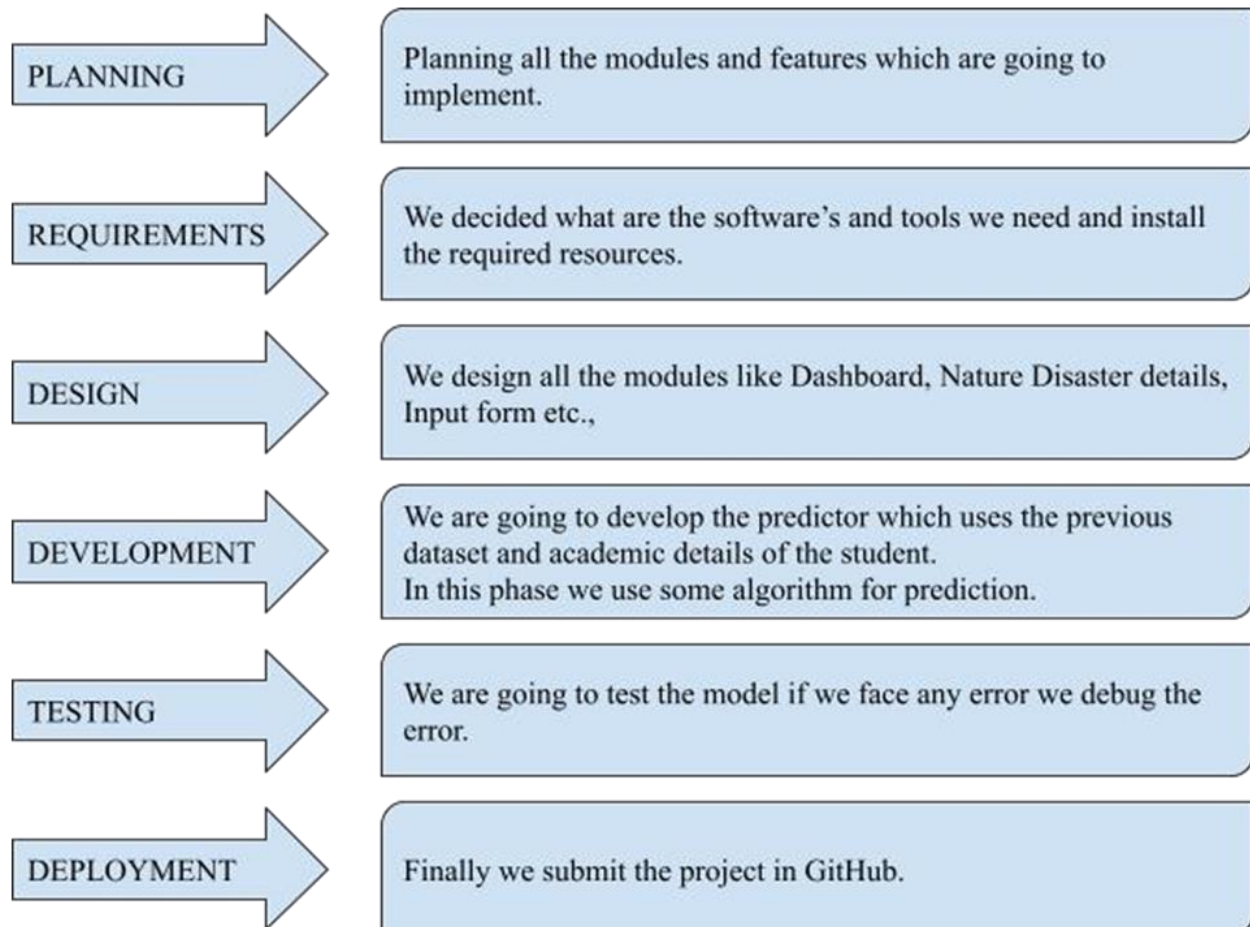
$$AV (\text{Sprint } 2) = 4/6 = 1$$

$$AV (\text{Sprint } 3) = 6/6 = 1$$

$$AV (\text{Sprint } 4) = 2/6 = 1$$

$$AV (\text{Total}) = 20/24 = 1 \text{ (appx., 1 sprint to be completed per day)}$$

## 6.2 Milestone and Activity List



## 6.3 REPORTS FROM JIRA

### ROADMAP

The screenshot displays the Jira Roadmap interface for the 'NDIACUAI board'. The top navigation bar includes 'Jira Software', 'Your work', 'Projects', 'Filters', 'Dashboards', 'People', 'Apps', and a 'Create' button. A search bar is located on the right. The left sidebar shows the project 'Natural Disasters Inten...' and a list of items under 'PLANNING' (NDIACUAI board, Roadmap, Backlog, Active sprints, Reports) and 'DEVELOPMENT' (Code, Releases, Project pages). The main area is titled 'Roadmap' and shows a timeline from October to November. It includes sections for 'Sprints' (NDIACUAI Sprint 1 and 2) and 'Releases'. A yellow bar highlights a task 'NDIACUAI-1 As a user I need to enroll t...' in the first sprint. A 'Quickstart' panel on the right lists steps like 'Create a project', 'Map out your project goals', 'Identify small chunks of work', 'Monitor and manage risk', 'Create an issue', and 'Invite your teammates'. The bottom status bar shows the Windows taskbar with the search bar, system icons, and the date/time (11:47 AM, 30-10-2022).

NDIACUAI board - Roadmap - Jira

https://pnt2022tmid46184.atlassian.net/jira/software/c/projects/NDIACUAI/boards/1/roadmap

Jira Software Your work Projects Filters Dashboards People Apps Create

Search

Natural Disasters Inten... Software project

Projects / Natural Disasters Intensity Analysis and Classification using AI / NDIACUAI board

Roadmap Give feedback Share Export

SR Status category

PLANNING

NDIACUAI board Board

Roadmap

Backlog

Active sprints

Reports

Issues

Components

DEVELOPMENT

Code

Releases

Project pages

You're in a company-managed project Learn more

NDIACUAI-1 As a user I need to enroll t...

NDIACUAI-2 As a user I need to enroll t...

NDIACUAI-14 As a user I adept to loggi...

NDIACUAI-15 Authentication

Create Epic

Today Weeks Months Quarters

Quickstart

- Create a project
- Map out your project goals
- Identify small chunks of work
- Monitor and manage risk
- Create an issue
- Invite your teammates

Issues are individual pieces of work that you assign to teammates.

Issues can be tasks or stories.

Show me View issue tutorial

Go to Settings to activate Windows.

Dismiss Quickstart

27°C Cloudy 11:47 AM 30-10-2022

## SPRINT INSIGHTS

NDIACUAI board - Agile Board - x

← → ↻ pnt2022mid46184.atlassian.net/jira/software/c/projects/NDIACUAI/boards/1?selectedIssue=NDIACUAI-4&quickFilter=2

Jira Software

Your work ▾ Projects ▾ Filters ▾ Dashboards ▾ People ▾ Apps ▾ Create

Q Search

🔊 ? ⚙️ SR

Projects / Natural Disasters Intensity Analysis and Classification using AI / NDIACUAI board

Sprint 1

🔍 ☆ ⌚ 0 days remaining Complete sprint 🔗 ⋮

Search this board 🔍 SR 👤 Only My Issues Recently Updated Clear all Insights

TO DO

IN PROGRESS

DONE

As a user I am logging into system with

download the dataset

Insights SPRINT 1

Sprint progress 100% done

Done	In progress	Not started
100%	0%	0%

Sprint burndown

Add estimates to manage and maintain scope

This insight helps you compare planned work against completed work, so you can track scope and pivot as needed. [Learn more](#)

Epic progress

Link epics and estimate issues to drive your big goals

This insight shows how your current sprint contributes to your larger goals, or epics, helping to maintain focus and perspective. [Learn more](#)

Give feedback

Quickstart

Create a project ▾

Create an issue ▴

Issue

Issues are individual pieces of work that you assign to teammates.

Issues can be tasks or stories.

Show me View issue tutorial

Invite your teammates ▾

Connect your tools ▾

Get the mobile app ▾

Find help: Windows ▾

Go to Settings to activate Windows.

Dismiss Quickstart

Type here to search

27°C Cloudy 12:03 PM 30-10-2022 ENG

## SPRINT

NDIACUAI board - Agile Board - X

pnt2022tmd46184.atlassian.net/jira/software/c/projects/NDIACUAI/boards/1?selectedIssue=NDIACUAI-4&quickFilter=2

Jira Software Your work Projects Filters Dashboards People Apps Create

Search

Projects / Natural Disasters Intensity Analysis and Classification using AI / NDIACUAI board

### Sprint 1

0 days remaining Complete sprint

Search this board SR Only My Issues Recently Updated Clear all Insights

TO DO

IN PROGRESS

DONE

As a user I adept to logging into the system with OTP  
NDIACUAI-3

download the dataset  
NDIACUAI-4

### Quickstart

- ✓ Create a project
- ✓ Create an issue
- ✓ Invite your teammates
- ✓ Connect your tools
- ✓ Get the mobile app
- ✓ Find help: Windows

Issues are individual pieces of work that you assign to teammates.

Issues can be tasks or stories.

Show me View issue tutorial

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Dismiss Quickstart

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27°C Cloudy 12:01 PM 30-10-2022

## 7. CODING & SOLUTIONING

### 7.1 Feature1

A convolutional neural network is a class of artificial neural networks. It is a Deep Learning algorithm that can take in an input image, assign importance to various objects in the image and be able to differentiate one from the other. The pre-processing required in a ConvNet is much lower as compared to other classification algorithms.

The advantage of CNNs is to provide an efficient dense network which performs the prediction or identification efficiently.

Code is attached below.

### 7.2 Feature2

We developed a multilayered deep convolutional neural network model that classifies the natural disaster and tells the intensity of disaster of natural. The model uses an integrated webcam to capture the video frame and the video frame is compared with the Pre-trained model and the type of disaster is identified and showcased on the OpenCV window.

A multilayer neural network with appropriate weights has been shown to be able to approximate any input-output function making it an attractive tool for modeling and forecasting.

Code is attached below.



## 8. TESTING

### 8.1 TEST CASE

Test case ID	Feature Type	Component	Test Scenario	Pre-Requisite	Steps To Execute	Test Data	Expected Result	Actual Result	Status	Comments	TC for Automation(Y/N)	BUG ID	Executed By
HomePage_TC_001	UI	Home Page	Verify user is able to see the home page and other tabs , when user entered into the website	internet and device	1. Enter URL and click go 2. click the tabs in the Navigation Bar	<a href="#">URL FOR THE WEBSITE</a>	Website should be visible	Working as expected	Pass	NA	N	NA	CHANDRUS JAYASWARANARAI D SHAMFARINPAKAZ M ASRAR A
HomePage_TC_002	UI	Home Page	verify user is able to see the results tab		1. Enter URL and click go 2. Click on results tab and check whether the user is able to see the flag card with open button	<a href="#">URL FOR THE WEBSITE</a>	Application should show below UI elements: a.header with live stream b. a camera glyphicon c. a button named open	Working as expected	Pass	NA	N	NA	CHANDRUS JAYASWARANARAI D SHAMFARINPAKAZ M ASRAR A
HomePage_TC_003	Functional	Home Page	Verify user is able to click the button on the results tab		1. Enter URL and click go 2. Click on results tab and check whether the user is able to click the button named open	<a href="#">URL FOR THE WEBSITE</a>	User should click the button named open	Working as expected	Pass	NA	N	NA	CHANDRUS JAYASWARANARAI D SHAMFARINPAKAZ M ASRAR A
HomePage_TC_004	Functional	camera	Verify user is able to see that the camera is accessible and open when the button is clicked		1. Enter URL and click go 2.click on results tab 3.click open button	<a href="#">URL FOR THE WEBSITE</a>	Application should be able to access the camera and see the livestream	Working as expected	Pass	NA	N	NA	CHANDRUS JAYASWARANARAI D SHAMFARINPAKAZ M ASRAR A
Camera_TC_004	Functional	camera	Verify user is able to capture the image from live stream		1. Enter URL and click go 2.click on results tab 3.click open button 4.camera is opened 5.click q button to capture image	<a href="#">URL FOR THE WEBSITE</a>	Application should be able to capture image from livestream	Working as expected	Pass	NA	N	NA	CHANDRUS JAYASWARANARAI D SHAMFARINPAKAZ M ASRAR A
Prediction_TC_005	Functional	output window	Verify user is able to see the predicted results in the window		when the image is captured again click q button to see the results	<a href="#">URL FOR THE WEBSITE</a>	Application should show the predicted results from the image captured	Working as expected	Pass	NA	N	NA	CHANDRUS JAYASWARANARAI D SHAMFARINPAKAZ M ASRAR A

### 8.2 USER ACCEPTANCE TESTING

#### 1.Purpose of Document

The purpose of this document is to briefly explain the test coverage and open issues of the Natural Disaster Intensity Analysis and Classification using Artificial Intelligence project at the time of the release to User Acceptance Testing (UAT).

#### 2.Defect Analysis

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

#### 3.Test Case Analysis

This report shows the number of test cases that have passed, failed, and untested they were solved.

Section	Total Cases	Not Tested	Fail	Pass
Print Engine	2	0	0	2
Client Application	3	0	0	3
Security	2	0	0	2
Outsource Shipping	3	0	0	3
Exception Reporting	1	0	0	1
Final Report Output	4	0	0	4
Version Control	2	0	0	2

Resolution	Severity 1	Severity 2	Severity 3	Severity 4	Subtotal
By Design	1	0	0	0	1
Duplicate	1	3	3	1	8
External	2	3	0	0	5
Fixed	2	4	4	2	12
Not Reproduced	0	0	0	1	1
Skipped	0	0	0	0	0
Won't Fix	0	0	0	0	0
Totals	6	10	7	4	27

## 9.RESULTS

*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 (MaxPooling2D)	(None, 14, 14, 32)	0
=====		
flatten (Flatten)	(None, 6272)	0
=====		
dense (Dense)	(None, 128)	802944
=====		
dense_1 (Dense)	(None, 4)	516
=====		

## Accuracy:

Please use `Model.fit`, which supports generators.

Epoch 1/20

149/149 [=====] - 23s 153ms/step - loss: 1.1720 - accuracy: 0.4933 - val\_loss: 0.8377 - val\_accuracy: 0.6667

Epoch 2/20

149/149 [=====] - 21s 139ms/step - loss: 0.8336 - accuracy: 0.6550 - val\_loss: 1.1909 - val\_accuracy: 0.4697

Epoch 3/20

149/149 [=====] - 21s 143ms/step - loss: 0.7105 - accuracy: 0.7399 - val\_loss: 0.8390 - val\_accuracy: 0.6717

Epoch 4/20

149/149 [=====] - 21s 141ms/step - loss: 0.5757 - accuracy: 0.7736 - val\_loss: 0.9805 - val\_accuracy: 0.6263

Epoch 5/20

149/149 [=====] - 22s 144ms/step - loss: 0.5806 - accuracy: 0.7817 - val\_loss: 0.7162 - val\_accuracy: 0.6768

Epoch 6/20

149/149 [=====] - 26s 175ms/step - loss: 0.5214 - accuracy: 0.8032 - val\_loss: 0.5987 - val\_accuracy: 0.8081

Epoch 7/20

149/149 [=====] - 21s 140ms/step - loss: 0.4666 - accuracy: 0.8450 - val\_loss: 0.5968 - val\_accuracy: 0.8283

Epoch 8/20

149/149 [=====] - 21s 140ms/step - loss: 0.4618 - accuracy: 0.8235 - val\_loss: 0.9052 - val\_accuracy: 0.7323

Epoch 9/20

149/149 [=====] - 21s 141ms/step - loss: 0.4026 - accuracy: 0.8450 - val\_loss: 0.6366 - val\_accuracy: 0.8030

Epoch 10/20

149/149 [=====] - 21s 139ms/step - loss: 0.3561 - accuracy: 0.8679 - val\_loss: 0.8216 - val\_accuracy: 0.7727

Epoch 11/20

149/149 [=====] - 21s 142ms/step - loss: 0.4345 - accuracy: 0.8410 - val\_loss: 0.6938 - val\_accuracy: 0.7879

...

Epoch 19/20

149/149 [=====] - 21s 142ms/step - loss: 0.2128 - accuracy: 0.9205 - val\_loss: 0.7216 - val\_accuracy: 0.8333

Epoch 20/20

149/149 [=====] - 21s 142ms/step - loss: 0.1734 - accuracy: 0.9434 - val\_loss: 0.8815 - val\_accuracy: 0.7980

## 10. ADVANTAGES & DISADVANTAGES

### ADVANTAGES:

- **FLOODS**–Nutrients are also added to rivers and lakes, improving the health of fish.
- **VOLCANOES**–Some valuable emissions from volcanoes are pumice, opal, gold, mercury, and metals.
- **HURRICANES**–The wind will cause topsoil to be distributed to areas in which it is lacking.
- **TSUNAMI**–Infrastructure development,Investment,Technology advancement.

### DISADVANTAGES:

- **FLOODS**–The loss of lives, vegetation, and infrastructure means there will be fewer people in the labor force.
- **VOLCANOES**–People and animals in the area are under threat and must be evacuated.
- **HURRICANES**–Strong winds can destroy large trees and buildings or use objects as missiles that can cause significant damage.
- **TSUNAMI**–Environmental degradation,Casualties,Health issues.

## 11. CONCLUSION

All of the five natural disasters are dangerous in their own way. When searching for the most dangerous one, we especially looked at the amount of deaths, rather than the reparation costs. All natural disasters can differ from not very dangerous to very dangerous. We tried to take the average of each natural disaster and compare them with each other.

- *Earthquakes* – Only the heaviest earthquakes cause many deaths and damage to buildings. Most of the time earthquakes can be predicted so people have time to move. Often there are no deaths because of the earthquake itself, but because of tsunamis etc. caused by the earthquake.
- *Volcanic eruption* – Volcanic eruptions, just as earthquakes, can cause many deaths. But in some cases these deaths are not caused by the eruption itself but by consequences of this eruption. The deadliest volcanic eruption took place in Indonesia in 1815, most deaths were caused by a famine caused by this eruption. Volcanic eruptions have advantages as well, the volcanic ash makes the soil fertile.
- *Tsunami* – A tsunami is often caused by earthquakes and will cause many more deaths than the earthquake itself most of the time. Some of the tsunamis even caused more than 250.000 deaths. It is especially dangerous at and near the coast, in low-lying areas.
- *Hurricane* – Just as the earthquakes it are often the tsunamis that cause the most deaths in a hurricane. The high wind speeds cause property damage, but normally not many deaths. The hurricane itself brings also much rainwater with it, but the tsunamis bring more water and are therefore more dangerous.
- *Drought* – A drought can be severe in poor countries, where the amount of food is limited and because of droughts crops will die, causing food shortages. Drought can also cause dehydration when

there is almost no water available. In rich countries however, droughts are less severe.

We think that tsunamis are the most dangerous natural disasters. They travel with a great speed of around 800 km/h and will destroy everything in their way. When earthquakes or hurricanes appear, the tsunamis caused by them are often the main cause of deaths. Tsunamis are followed by drought, especially in poor countries it causes severe problems.

## **12. FUTURES SCOPE**

A disaster is an unplanned event in which the needs of the affected community outweigh the available resources. A disaster occurs somewhere in the world almost daily, but these events vary considerably in scope, size, and context. Large-scale disasters with numerous casualties are relatively unusual events. Certain widely publicized disasters, including events such as the terrorist attacks on September 11, 2001, Hurricanes Katrina and Sandy, and the Boston Marathon bombing, have focused people's attention on disaster planning and preparedness. Disasters are becoming more frequent, and the number of persons affected is also increasing. This greater morbidity is attributable not only to the greater number of events, but also to population dynamics, location, and susceptibilities.

While these incidents have led to an increase in general disaster awareness, the relative infrequency of major catastrophes affecting defined populations leads to a certain degree of complacency and underestimation of the impact of such an event. In the wake of a large-scale event, public attention focuses on disaster planning and preparedness and the resources dedicated to improving response and resiliency surge.

## 13. APPENDIX

### Source Code

**home.html:**

```
<!DOCTYPE html>
```

```
<html lang="en">
```

```
<head>
```

```
  <title>Home Page</title>
```

```
  <meta charset="utf-8">
```

```
  <meta name="viewport" content="width=device-width, initial-scale=1">
```

```
  <link rel="stylesheet"
href="https://maxcdn.bootstrapcdn.com/bootstrap/3.4.1/css/bootstrap.min.css">
```

```
  <link href="https://fonts.googleapis.com/css?family=Montserrat" rel="stylesheet"
type="text/css">
```

```
  <link href="https://fonts.googleapis.com/css?family=Lato" rel="stylesheet"
type="text/css">
```

```
  <script
src="https://ajax.googleapis.com/ajax/libs/jquery/3.5.1/jquery.min.js"></script>
```

```
  <script
src="https://maxcdn.bootstrapcdn.com/bootstrap/3.4.1/js/bootstrap.min.js"></scri
pt>
```

```
<style>
```



```
body {  
  
  font: 400 15px Lato, sans-serif;  
  
  line-height: 1.8;  
  
  color: #818181;  
  
}
```

```
h2 {  
  
  font-size: 24px;  
  
  text-transform: uppercase;  
  
  color: #303030;  
  
  font-weight: 600;  
  
  margin-bottom: 30px;  
  
}
```

```
h4 {  
  
  font-size: 19px;  
  
  line-height: 1.375em;  
  
  color: #303030;  
  
  font-weight: 400;  
  
  margin-bottom: 30px;  
  
}
```

```
.jumbotron {  
  
  background-color: #f4511e;
```

color: #fff;

font-family: Montserrat, sans-serif;

}

.container-fluid {

padding: 60px 50px;

}

.g-grey {

background-color: #f6f6f6;

}

.logo-small {

color: #f4511e;

font-size: 50px;

}

.logo {

color: #f4511e;

font-size: 200px;

}

.thumbnail {

padding: 0 0 15px 0;

border: none;

border-radius: 0;

}

.thumbnail img {

width: 100%;

height: 100%;

margin-bottom: 10px;

}

.carousel-control.right, .carousel-control.left {

background-image: none;

color: #f4511e;

}

.carousel-indicators li {

border-color: #f4511e;

}

.carousel-indicators li.active { background-color: #f4511e;

}

.item h4 {

font-size: 19px;

line-height: 1.375em;

font-weight: 400;

font-style: italic;

margin: 70px 0;

}

```
.item span {  
    font-style: normal;  
}  
  
.panel {  
    border: 1px solid #f4511e;  
    border-radius: 0 !important;  
    transition: box-shadow 0.5s;  
}  
  
.panel:hover {  
    box-shadow: 5px 0px 40px rgba(0,0,0, .2);  
}  
  
.panel-footer .btn:hover {  
    border: 1px solid #f4511e;  
    background-color: #fff !important;  
    color: #f4511e; }  
  
.panel-heading {  
    color: #fff !important;  
    background-color: #f4511e !important;  
    padding: 25px; border-bottom: 1px solid transparent;  
    border-top-left-radius: 0px;  
    border-top-right-radius: 0px;
```

```
border-bottom-left-radius: 0px;

border-bottom-right-radius: 0px;

}

.panel-footer {

background-color: white !important;

}

.panel-footer h3 {

font-size: 32px;

}

.panel-footer h4 {

color: #aaa;

font-size: 14px;

}

.panel-footer .btn {

margin: 15px 0;

background-color: #f4511e;

color: #fff;

}

.navbar {

margin-bottom: 0;

background-color: #0059ff;
```

```

z-index: 9999;

border: 0;

font-size: 12px !important;

line-height: 1.42857143 !important;

letter-spacing: 4px; border-radius: 0; font-family:
    Montserrat, sans-serif;
}

.navbar li a, .navbar .navbar-brand {

    color: #fff !important;
}

.navbar-nav li a:hover, .navbar-nav li.active a {

    color: #f4511e !important;

    background-color: #fff !important;
}

.navbar-default .navbar-toggle {

    border-color: transparent;

    color: #fff !important;
}

footer .glyphicon {

    font-size: 20px;

    margin-bottom: 20px;

```

```
    color: #f4511e;
}

.slideanim {visibility:hidden;}

.slide {

    animation-name: slide;

    -webkit-animation-name: slide;

    animation-duration: 1s;

    -webkit-animation-duration: 1s;

    visibility: visible;
}

@keyframes slide {

    0% { opacity: 0;    transform: translateY(70%);
}

    100% {

        opacity: 1;

        transform: translateY(0%);

    }
}

@-webkit-keyframes slide {

    0% {

        opacity: 0;
```

```
-webkit-transform: translateY(70%);  
  
}  
  
100% {  
  
    opacity: 1;  
  
    -webkit-transform: translateY(0%);  
  
}  
  
}  
  
@media screen and (max-width: 768px) {  
  
    .col-sm-4 {  
  
        text-align: center;  
  
        margin: 25px 0;  
  
    }  
  
    .btn-lg {  
  
        width: 100%;  
  
        margin-bottom: 35px;  
  
    }  
  
}  
  
@media screen and (max-width: 480px) {  
  
    .lgo {  
  
        font-size: 150px;  
  
    }
```



```
}
```

```
.container {
```

```
    padding: 16px;
```

```
    max-width: max-content;
```

```
}
```

```
.container {
```

```
    max-width: 1376px;
```

```
    margin: auto;
```

```
    padding: 2rem 1.5rem;
```

```
}
```

```
.cards {
```

```
    display: flex;
```

```
    flex-wrap: wrap;
```

```
    align-items: center;
```

```
    justify-content: center;
```

```
}
```

```
.card {
```

```
cursor: pointer;

background-color: transparent;

height: 300px;

perspective: 1000px;

margin: 1rem;

align-items: center;      justify-content: center;

}
```

```
.card h3 {

border-bottom: 1px #fff solid;

padding-bottom: 10px;

margin-bottom: 10px;

text-align: center;

font-size: 1.6rem;

word-spacing: 3px;

}
```

```
.card p{

opacity: 0.75;

font-size: 0.8rem;

line-height: 1.4;
```

```
}
```

```
.card img {
```

```
width: 360px;
```

```
height: 300px;
```

```
object-fit: cover;
```

```
border-radius: 3px;
```

```
}
```

```
.card-inner {
```

```
position: relative;
```

```
width: 360px;
```

```
height: 100%;
```

```
transition:
```

```
transform 0.9s;
```

```
transform-style: preserve-3d;
```

```
}
```

```
.card:hover .card-inner {
```

```
transform: rotateY(180deg);
```

```
}
```

```
.card-front,  
.card-back {  
    position: absolute;  
    width: 360px;  
    height: 100%;  
    -webkit-backface-visibility: hidden;  
    backface-visibility: hidden;  
}
```

```
.card-back {  
    background-color: #222;  
    color: #fff;  
    padding: 1.5rem;  
    transform: rotateY(180deg);  
}
```

```
.text-block {  
    position: absolute;  
    bottom: 20px;  
    right: 20px;  
    background-color:  
black; color: white;
```

```
padding-left: 20px;  
padding-right: 20px;  
}
```

```
.features-section img {  
display: none;  
}
```

```
.testimonials-section {  
background: var(--primary-colour);  
color: white;  
}
```

```
.testimonials-section li {  
background: #0059ff;  
text-align: center;  
width: 80%;  
border-radius: 1em;  
}
```

```
.testimonials-section li img {  
width: 6em;
```

```
height: 6em;

border: 3px solid #ffffff;

border-radius: 50%;

margin-top: -2.5em;

}
```

```
ul {
  list-style-type: none;

  margin: 0;

  padding: 0;

}
```

```
ul.features-list
{   margin: 0;

    padding-left: .1em;

}
```

```
ul.features-list li {

  font-size: 1.1em;

  margin-bottom: 1em;

  margin-left: 2em;

  position: relative;
```

```
}
```

```
ul.features-list li:before {  
    content: "";  
    left: -2em;  
    position: absolute;  
    width: 20px;  
    height: 20px;  
    background-image: url("#");  
    background-size: contain;  
    margin-right: .5em;  
}
```

```
.features-section img {  
    display: none;  
}
```

```
</style>
```

```
</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;">AI based Natural Disaster Analysis</h3>
```

```
</div>
```

```
<div class="container-fluid">
```

```
<div class="container">
```

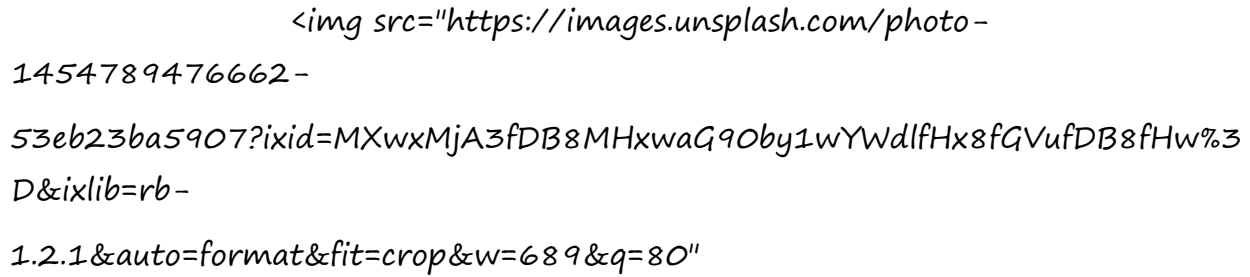
```
<div class="cards">
```

```
<div class="card">
```

```
<div class="card-inner">
```

```
<div class="card-front">
```



1454789476662-53eb23ba5907?ixid=MXwxMjA3fDB8MHxwaG90by1wYWdlfHx8fGVufDB8fHw%3D&ixlib=rb-1.2.1&auto=format&fit=crop&w=689&q=80"

alt="">

<div class="text-block">

<h1>Cyclone</h1>

<h3>violent winds, torrential rain, high waves and, very destructive storm</h3>

</div>

</div>

<div class="card-back">

<h3>Cyclone</h3>

<h3>The effects of tropical cyclones include heavy rain, strong wind, large storm surges near

landfall, and tornadoes. The destruction from a tropical cyclone, such as a hurricane or

tropical storm, depends mainly on its intensity, its size, and its location.</h3>

</div>

</div>

</div>

```
<div class="container">
```

```
<div class="cards">
```

```
<div class="card">
```

```
<div class="card-inner">
```

```
<div class="card-front">
```

```

```

```
<div class="text-block">
```

```
<h1>Earth Quake</h1>
```

```
<h2>Sudden release of stored energy in the Earth's  
crust that creates seismicwaves.
```

```
</h2>
```

```
</div>
```

```
</div>
```

```
<div class="card-back">
```

```
<h3>Earth Quake</h3>
```

`<h3>`Earthquakes are usually caused when rock underground suddenly breaks fault.

This sudden release of energy causes the seismic waves that make the ground shake.

... During the earthquake and afterward, the plates or blocks of rock start moving,

and they continue to move until they get stuck again.`</h3>`

`</div>`

`</div>`

`</div>`

`<div class="container">`

`<div class="cards">`

`<div class="card">`

`<div class="card-inner">`

`<div class="card-front">`

``

`<div class="text-block">`

`<h1>Flood</h1>`

`<h3>A flood is an overflow of water on normally  
dry ground</h3>`

`</div>`

`</div>`

`<div class="card-back">`

`<h3>Flood</h3>`

`<h3>During heavy rain, the storm drains can  
become overwhelmed or plugged by`

`debris and flood the roads and buildings nearby.`

`Low spots, such as`

`underpasses, underground parking garages,  
basements, and low water crossings`

`can become death traps. Areas near rivers are at  
risk from floods.</h3>`

`</div>`

`</div>`

`</div>`

`<div class="container">`

`<div class="cards"`

`<div class="card">`

`<div class="card-inner">`

`<div class="card-front">`

``

`<div class="text-block">`

`<h1>WildFire</h1>`

`<h3>Uncontrolled fire in a forest,  
grassland, brushland</h3>`

`</div>`

`</div>`

`<div class="card-back">`

`<h3>Wildfire</h3>`

`<h3>Wildfires can be caused by an  
accumulation of dead matter (leaves,`

`twigs, and trees) that can create enough  
heat in some instances to`

`spontaneously combust and ignite the  
surrounding area. Lightning`

`strikes the earth over 100,000 times a  
day. 10 to 20% of these`

`lightning strikes can cause fire.</h3>`

`</div>`

`</div>`

</div>

</div>

## intro.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"> <link
```

```
href="https://cdn.jsdelivr.net/npm/bootstrap@5.2.2/dist/css/boot-  
strap.min.css" rel="stylesheet" integrity="sha384-
```

```
Zenh87qX5JnK2JlOVWa8Ck2rdkQ2Bzep5IDxbcnCeuOxjzrPF/et3URy9Bv1WTRi"  
crossorigin="anonymous">
```

```
<title>Document</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" aria-current="true" href="home.html" style="font-size:
```

24px;">Home</a>

</li>

<li class="nav-item">

<a class="nav-link active" 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;">AI based Natural Disaster Analysis</h3>

</div>

</div>

<h2 style="padding: 50px; margin: 50px; word-spacing: 15px; text-align: center ;line-height: 1.6;">

China, India and the United States are among the countries in the world most affected by natural disasters. Natural disasters have the potential to wreck and even end the lives of those people, who stand in their way. <br><br> However, whether or not you are likely to be affected by a natural disaster dramatically depends on where in the world you live, The objectiveofthe project is to human build a web application to detect the type of disaster. The input is taken from the in-built webcam, which in turn is given to the pre-trained model. The model predicts the type of disaster and displayed on UI. </h2>

</body>

</html>

**upload.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"> <link
href="https://cdn.jsdelivr.net/npm/bootstrap@5.2.2/dist/css/boot-
strap.min.css" rel="stylesheet" integrity="sha384-
Zenh87qX5JnK2JlOvWa8Ck2rdkQ2Bzep5IDxbcnCeuOxjzrPF/et3U
Ry9Bv1WTRi" crossorigin="anonymous">

<title>Document</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" 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 active" href="upload.html" style="font-size: 24px;">Upload</a>

</li>

</ul>

<h3 style="float: right;">AI based Natural Disaster Analysis</h3>

</div>

</div>

<form action = "uploader.html" method = "POST" enctype = "multipart/form-
data">

<input type = "file" name = "filename" />

<input type = "submit" value="Submit"/>

</form>

<script
src="https://cdn.jsdelivr.net/npm/@popperjs/core@2.11.6/dist/umd/popper.min.js
" integrity="sha384-
oBqDVmMz9ATKxlep9tiCXS/Z9fNfEXiDAYTujMAeBAsjFuCZSmKbSSUnQlmh/jp3"
crossorigin="anonymous"></script>

<script
src="https://cdn.jsdelivr.net/npm/bootstrap@5.2.2/dist/js/bootstrap.min.js"
integrity="sha384-

```

```
IDwe1+LCz02ROU9k972gdyvl+AESN10+x7tBKgc9l5HFtuNzOWWnPclzo6p9vxnk"crossorigin="anonymous"></script>
```

```
</body>
```

```
</html>
```

**GitHub Link:**

<https://github.com/IBM-EPBL/IBM-Project-52596-1661012044>