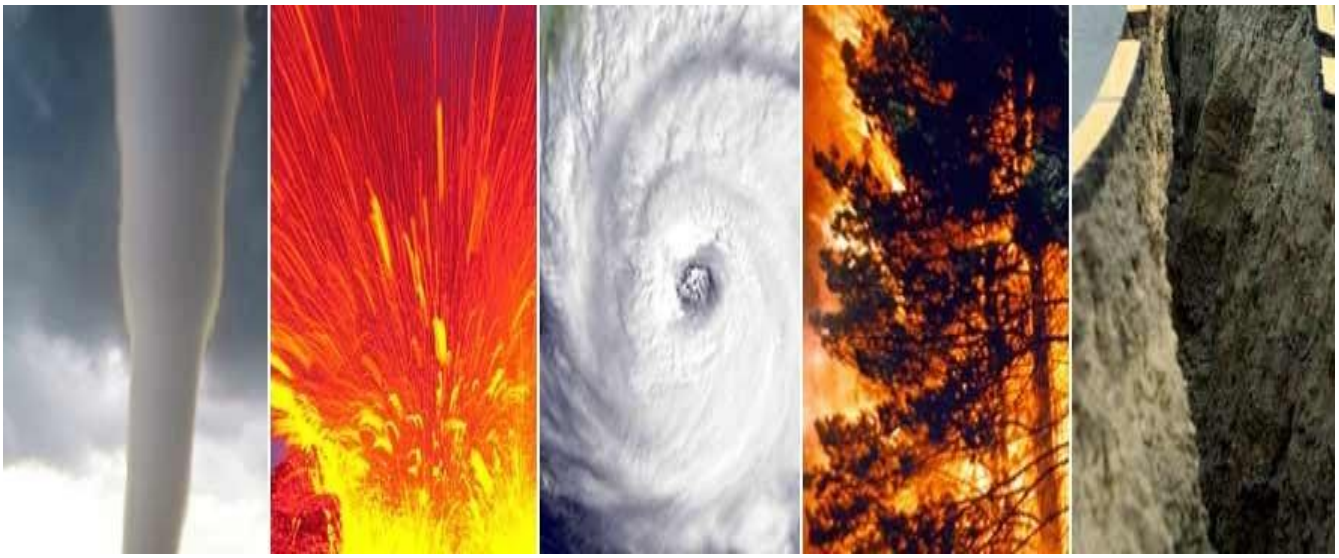
PROJECT REPORT

Natural Disasters Intensity Analysis and Classification using Artificial Intelligence



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CHAPTER 1
INTRODUCTION

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. Many deep learning techniques have been applied by various researchers to detect and classify natural disasters to overcome losses in ecosystems, but detection of natural disasters still faces issues due to the complex and imbalanced structures of images. 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.

PURPOSE

Disaster management plays an integral role in **keeping communities safe**. It involves coordinating the resources, such as pollution control systems, and responsibilities, such as following best practice policies, needed to prevent, prepare for, respond to, and recover from emergencies.Natural disasters generally constitute an emergency since they require immediate intervention due to their **high impact on human health and safety**; they affect the normal functioning of working infrastructure, interrupting normal day activities and representing a risk for residents and workers in affected areas.

CHAPTER 2
LITERATURE SURVEY

EXISTING PROBLEM

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.

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PROBLEM STATEMENT DEFINITION

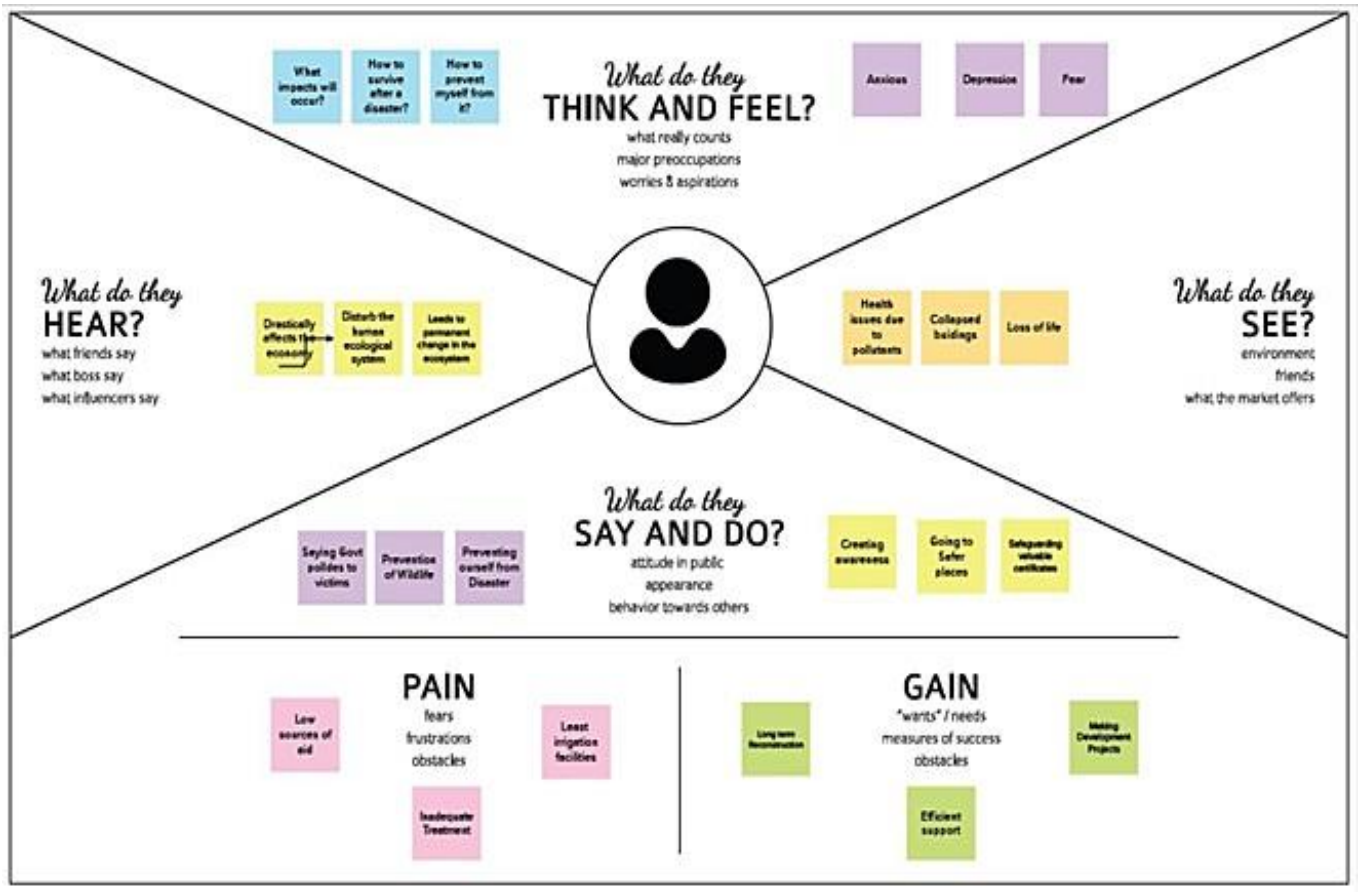
"IMD (Indian Meteorology department) is responsible to issue warnings for the rainfall and CWC (Central Water Commission) keeps a record of water reservoirs, however there is a lack of collation of data issued from both these departments. This prevents us from determining the impact/seriousness and due to which there are times where adequate forewarnings are not provided. There are several High rainfall areas, low lying areas or flood prone areas. Currently there are limitations that these areas cannot be alerted before the critical situation because of the data

unavailability or unavailability of simulation models which can calculate and predict the data. There is a requirement of data on the area likely to be inundated(depth) by release of water from reservoirs. 3D models may help in calculation of such data.a) Adequate forewarning for the area where floods are likely to occur. b) Low lying areas may be alerted about the release of accurate quantity of water from the reservoirs and thus evacuation/shifting of the people can be planned. c) It will help the Response forces to deploy their resources accordingly d) Prediction of release of water based on rainfall in catchment area and dissemination of an information to the affected public through mobile and other mediums."

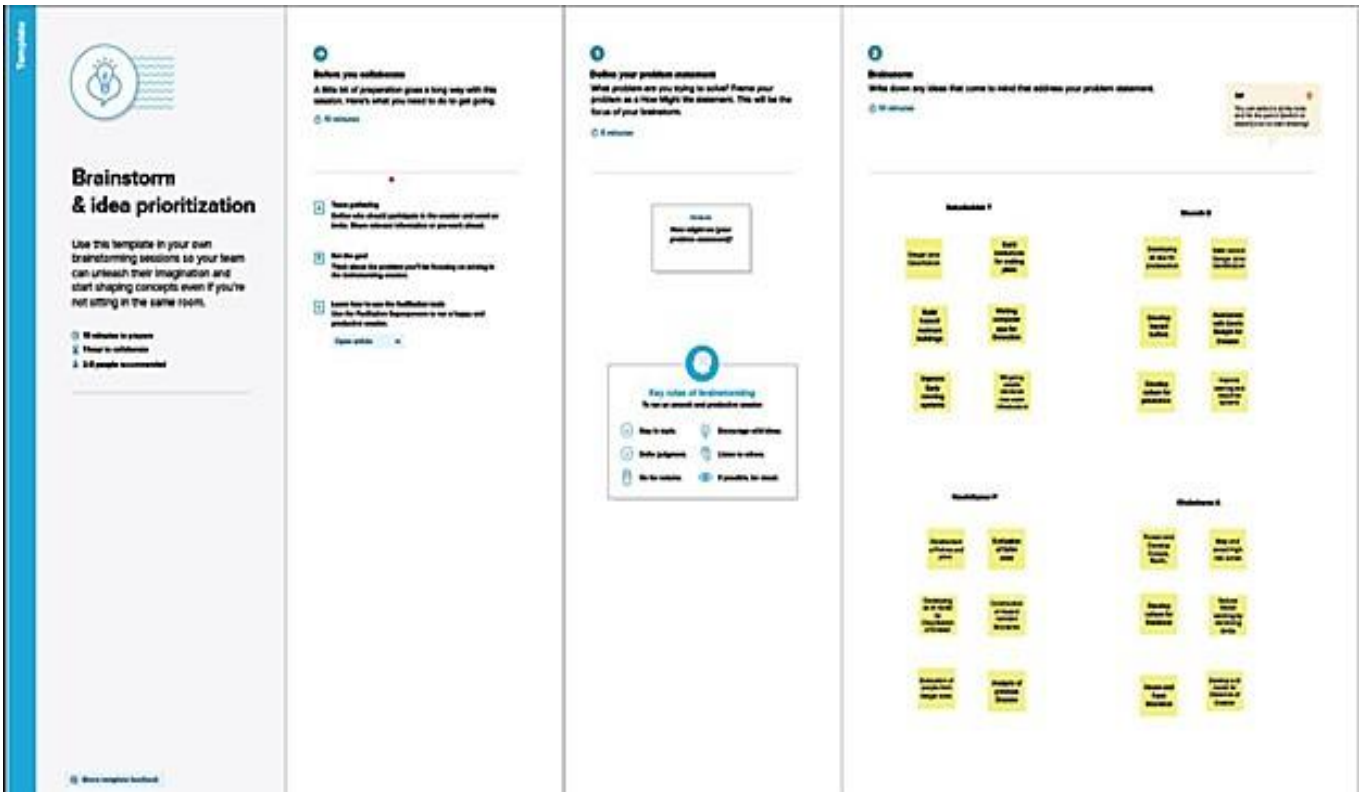
CHAPTER 3

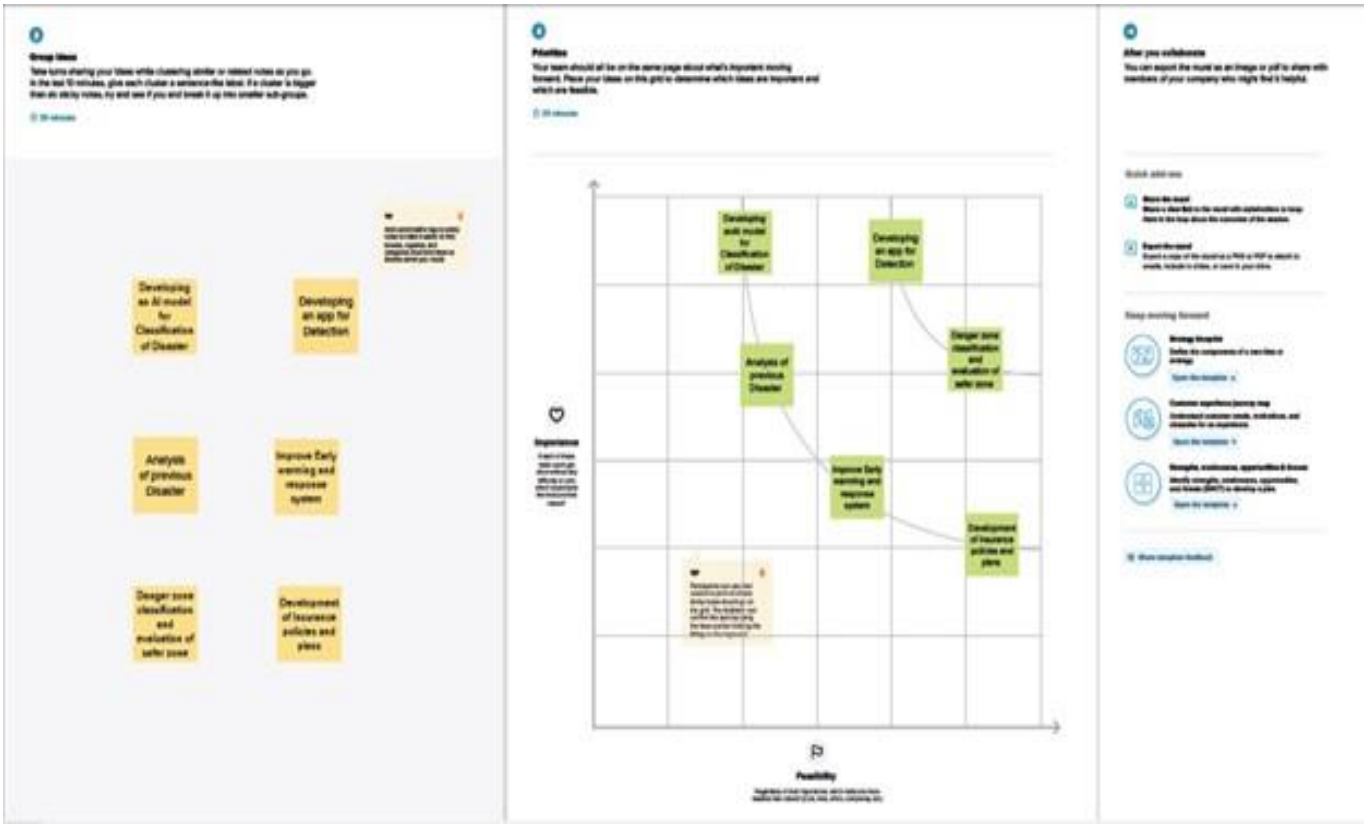
IDEATION AND PROPOSED SOLUTION

EMPATHY MAP CANVAS



IDEATION & BRAINSTORMING

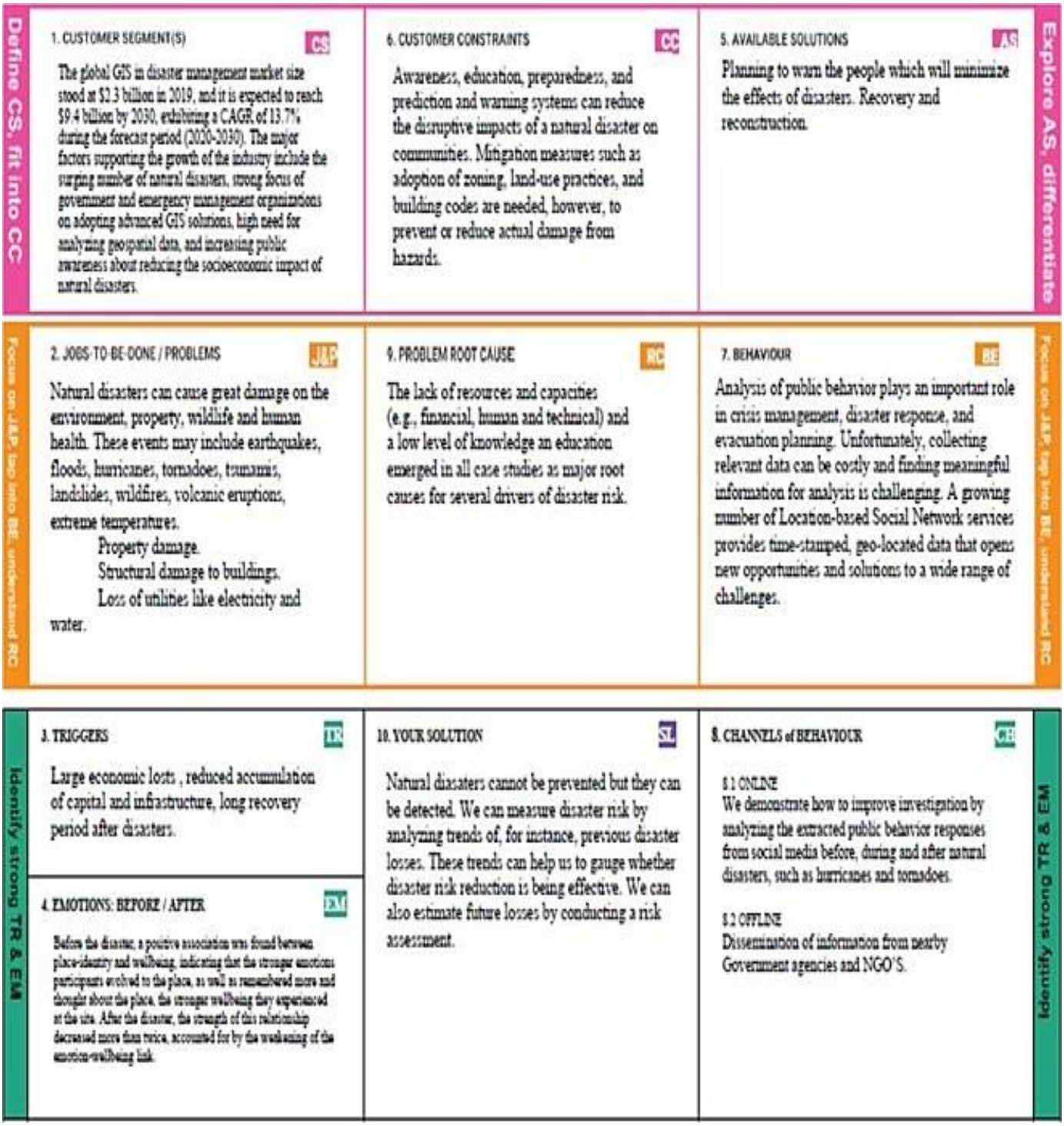




PROPOSED SOLUTION

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	To classify the natural disaster and the effect based on the webcam image given as input using Artificial Intelligence.
2.	Idea / Solution description	The classification is done by deep learning techniques such as Convolutional Neural Network (CNN) and Machine Learning Techniques.
3.	Novelty / Uniqueness	It is based on the satellite and multispectral image and the classification using Multilayered Deep Convolutional Neural Networks.
4.	Social Impact / Customer Satisfaction	The people can easily identify the type of natural disaster and its effect on the environment which leads to the earlier identification and reduced damage in the ecosystem.
5.	Business Model (Revenue Model)	We build a system that classifies the natural diasater and its intensity and it is believed that the website is useful for all people and also the website works for a long time effectively.
6.	Scalability of the Solution	The website will be made available for all the people who needs to classify the type of natural disaster. The machine learning and deep learning algorithms that are being used made it easier for the classification and intensity analysis.

PROBLEM
SOLUTION FIT



CHAPTER 4

REQUIREMENT ANALYSIS

FUNCTIONAL REQUIREMENTS

FR No.	Functional Requirement(Epic)	Sub Requirement (Story / Sub-Task)
FR - 1	User Registration	1. Registering via Google Accounts 2. Registering via Product's own user managementsystem
FR - 2	User Authentication	1. Verification through OTP 2. Verification through EmailLink
FR - 3	Designation of Region	1. Ease of selection of necessary areasto bemonitored 2. Versatile and Flexible operations on designatedareas
FR - 4	Analysis of Required Phenomenon	1. Simple and easy analysis on the specificphenomenon to be observed
FR - 5	Accumulation of required Data	1. Fast and Efficient data gathering capabilities regarding past eventanalysis and futureprediction
FR - 6	Organizing Unstructured data	1. Processing of raw and clustered data into clearandrefined data which is useful for analysis and prediction tasks

FR - 7	Algorithm selection	1.	The freedom to choose fromseveral classes ofalgorithm to be used in the process
		2.	Customization of algorithm to suit the needs of aspecific purpose
FR - 8	Prediction and analysis of data	1.	Accurate results of the analysis provided by theprocess
		2.	Advanced visualization techniques to help visualizethe processed data for effective observation
FR - 9	Report generation	1. Restructuring of obtained results into clearanddetailed reportfor future studies	

NON-FUNCTIONAL REQUIREMENTS

NFR No.	Non-Functional Requirement	Description
NFR - 1	**Usability**	It is well suitedfor fields requiring diverseapplication of processes with efficiency , precision and ease.
NFR - 2	**Security**	It provides a distinct and secure encryption layer to the system interface for additional security standards.
NFR - 3	**Reliability**	The product is robust and is capable of execution of processes even in the most difficult and unpredictable environments.

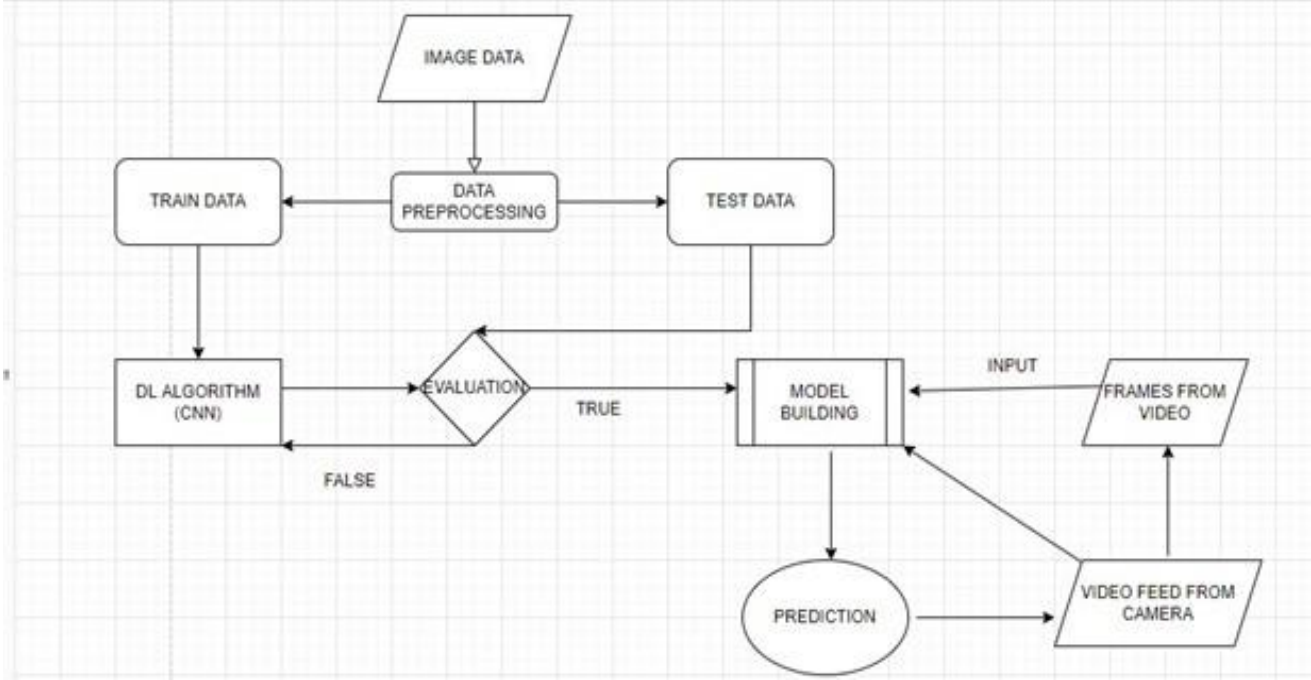
NFR - 4	**Performance**	The product boasts a high precision and efficient working capacity which helps in escalating its performance to the highest degree.
NFR - 5	**Availability**	Despite the complexity and degree of difficulty in its operation, the product is equipped with all-round maintenance andreadily available technical services whichprovides the necessary support any individual requires in their duties.
NFR - 6	**Scalability**	The product also possess enoughroom forthe improvement of its specifications to upgrade its capabilities according to the needs of the user and theirorganization

CHAPTER 5

PROJECT DESIGN

DATA FLOW DIAGRAM

A Data Flow Diagram (DFD) is a traditional visual representation of the information flows within a system. A neat and clear DFD can depictthe right amountof the systemrequirement graphically. It shows how data entersand leaves the system, what changes the information, and where datais stored.



USER STORIES

User Type	Functional Requirement (Epic)	User StoryNumber (USN)	User Story / Task	Acceptan cecriteria	Priority	Release
End user (Customer)	Registration	USN - 1	As a user, I am able to register with theProduct using my valid emailaddress	I should be able to register with my account credentials	High	Sprint - 1
End User (Customer)	Authentication	USN - 2	As a user, I am able to login into the system with my credentials	It should ensure smooth login capabilities withoutdelay	High	Sprint - 1

End User (Customer)	Designation ofRegion	USN - 3	I can select the regionof interest to be monitored and analyzed	I mustbe able to choose certain specific places without error	High	Sprint - 1
End User (Customer)	Analysis of Required Phenomenon	USN - 4	I am able to monitor certain factors that influence the actions ofthe phenomenon	It should consider and monitormostof the factors involved in the action	High	Sprint - 2
End User (Customer)	Accumulation of required Data	USN - 5	I am able to gather data regarding past events and a detailed report on past analysis	It shouldallow the storage of data ofpast events for certain extent	Medium	Sprint - 2
End User (Customer)	Organizing Unstructured data	USN - 6	I am able to organizeand restructure the raw data into refineddata	It should ensureeasy and efficient processing methods	Low	Sprint - 3

End User (Customer)	Algorithmselection	USN - 7	I am ableto choose the required Algorithmfor a specific analysis	It mustprovide various options for the algorithm to be used	High	Sprint - 2
End User (Customer)	Prediction and analysis of data	USN - 8	I am able to easily predict and visualize thedata	It shouldallow easy to use prediction and visualization techniques	High	Sprint - 3

End User (Customer)	Report generation	USN - 9	I am able to generatea clear and detailed report on the analysis	Report generation must be fast and efficient andshouldnot be complex	Medium	Sprint - 4

CHAPTER 6

PROJECT PLANNING AND SCHEDULING

SPRINT PLANNING AND ESTIMATION

Sprint	Functional Requirement(Epic)	User story Number	User story / Task	Story points	Priority	Team members
Sprint-1	Registration	USN – 1	As a user, Registering into the product usinga valid email address	5	High	Selva Sathish T
Sprint-2	Registration	USN – 2	As a user, Registering into the product usinga valid username andpassword	3	Medium	Nawin Kumar P
Sprint-1	Authentication	USN – 3	As a user , I adept to logginginto the system with credentials	4	High	Selva Sathish T
Sprint-2	Authentication	USN - 4	As a user , I adept to logging intothe systemwithOTP	2	High	Nawin Kumar P
Sprint-1	Designation ofRegion	USN – 5	selecting the region ofinterest to be monitored and analysed	3	High	Kiruba Karan A Selva Sathish T
Sprint-2	Analysis of Required Phenomen	USN – 6	Regulating certain factors influencing theactions of the	3	High	Sharath B

	on		phenomenon			
Sprint-2	Accumulation ofrequired Data	USN – 7	Gathering data and detailed report on pastevent analysis	4	Medium	Kiruba Karan A Nawin Kumar P
Sprint-4	Organizing Unstructur eddata	USN – 8	Organizing and reorienting the raw data into a refined data	3	Low	Selva Sathish T Sharath B
Sprint-2	AlgoriT hm selection	USN – 9	Choosing a required algorithm for specificanalysis	2	High	Selva Sathish T Kiruba Karan A Sharath B
Sprint-3	Prediction and analysis of data	USN – 10	Predicting and visualizing the dataeffectively	6	High	Sharath B Kiruba Karan A Selva Sathish T Nawin Kumar P
Sprint-4	Report generati on	USN – 11	Generating a clear anddetailed report on productdata analysis	3	High	Nawin Kumar P Selva Sathish T

SPRINT DELIVERY:

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	12	6 days	24 Oct 2022	29 Oct 2022	12	30 Oct 2022
Sprint-2	14	6 days	31 Oct 2022	5 Nov2022	14	6 Nov 2022
Sprint-3	6	6 days	07 Nov2022	12 Nov2022	6	8 Nov 2022
Sprint-4	6	6 days	14 Nov2022	19 Nov2022	6	20 Nov 2022

CHAPTER 7
CODING & SOLUTIONING

Feature 1:

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.

Feature 2:

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.

CHAPTER 8
TESTING

8. TESTING:

Test Cases
User Acceptance Testing

This document serves as a quick reference for the Deep Learning Fundus Image Analysis for Early Detection of Diabetic Retinopathy project's test coverage and open issues as of the project's release for user acceptance testing.

Defect Analysis:-

This shows how many bugs were fixed or closed at each severity level and how they were fixed.

Resolution	Severity 1	Severity 2	Severity 3	Severity 4	Subtotal
By Design	4	5	2	3	14
Duplicate	1	0	3	1	5
External	2	3	0	1	6
Fixed	9	2	4	15	30
Not Reproduced	0	0	1	0	1
Skipped	1	0	1	1	3
Won't Fix	0	5	2	1	8
Totals	17	14	13	22	64

Test-Case Analysis

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

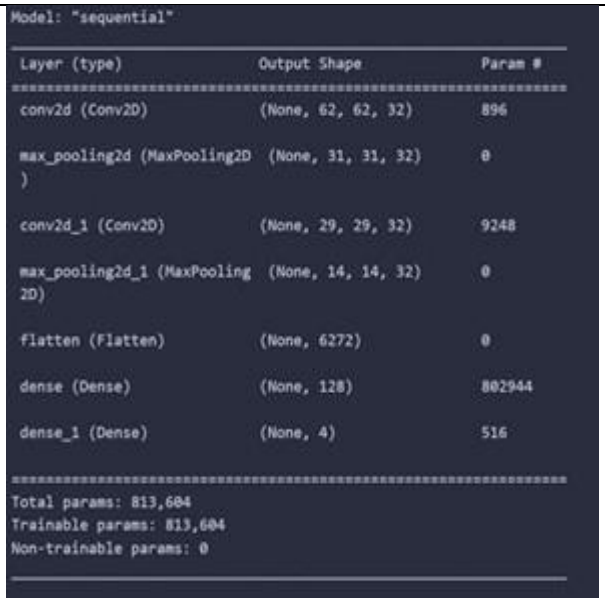
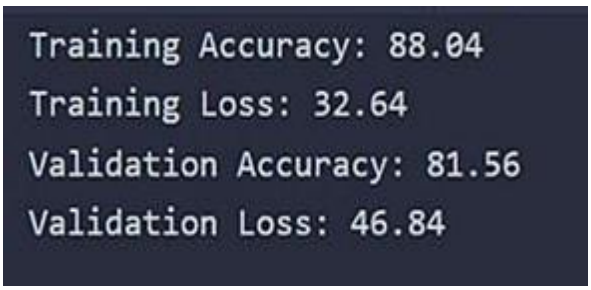
Section	Total Cases	Not Tested	Fail	Pass
Print Engine	9	0	0	9
Client Application	40	0	0	40
Security	3	0	0	3
Out-source Shipping	3	0	0	3

Exception Reporting	8	0	0	8
Final Report Output	4	0	0	4
Version Control	2	0	0	2

CHAPTER 9

RESULTS

9.1 PERFORMANCE METRICS

S.No.	Parameter	Values	Screenshot
1.	Model Summary	-	
2.	Accuracy	Training Accuracy – 88.04% Validation Accuracy -81.56%	

CHAPTER 10

ADVANTAGES & DISADVANTAGES

ADVANTAGES:-

1. Humans also need breaks and time offs to balance their work life and personallife. But AI can work endlessly without breaks.
2. With the use of various AI-based techniques, we can also anticipate today'sweather and the days ahead.
3. Helpful in getting life back on track..
4. Their Alert nature able to respond effectively and efficiently which defend thesociety from large scale damages.

DISADVANTAGES:-

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 irrelevantoutputs which could be a major backdrop.

CHAPTER 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.

CHAPTER 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 intensity of hurricanes and read the geological data to understand volcanic eruptions, such systems can reduce 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 an accuracy 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 the future, 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.

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"></script>

  <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;
}
.bg-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) {
  .logo {
```

```
    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">
              <img src="https://images.unsplash.com/photo-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">
                    <img src="https://images.unsplash.com/photo-1603869311144-
66b03d340b32?ixid=MXwxMjA3fDB8MHxzZWFyY2h8M3x8ZWFydGhxdWFrZXxlbnwwfHwwfA%3
D%3D&ixlib=rb-1.2.1&auto=format&fit=crop&w=500&q=60"
                      alt="">
```

```
                    <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">
                        <img src="https://images.unsplash.com/photo-1547683905-
f686c993aae5?ixid=MXwxMjA3fDB8MHxzZWFyY2h8MXx8Zmxvb2R8ZW58MHx8MHw%3D&ixlib
=rb-1.2.1&auto=format&fit=crop&w=500&q=60"
                          alt="">
                        <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 plugge by
                            debris and flood the roads and buildings nearby. Low spots, such as
                            underpasses, underground parking garages, basements, and low watecrossings
                            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">
                                <img src="https://images.unsplash.com/photo-1473260079709-
83c808703435?ixid=MXwxMjA3fDB8MHxzZWFyY2h8NHx8d2lsZGZpcmV8ZW58MHx8MHw%3D
&ixlib=rb-1.2.1&auto=format&fit=crop&w=500&q=60"
                                    alt="">
                                <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/bootstrap.min.css"
rel="stylesheet" integrity="sha384-
Zenh87qX5JnK2Jl0vWa8Ck2rdkQ2Bzep5IDxbcnCeuOxjzrPF/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">
```

Introduction

<li class="nav-item">

Upload

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

<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.

 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/bootstrap.min.css"

rel="stylesheet" integrity="sha384-

```
Zenh87qX5JnK2Jl0vWa8Ck2rdkQ2Bzep5IDxbcnCeuOxjzrPF/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" 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-
oBqDVmMz9ATKxIep9tiCxS/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+x7tBKgc9I5HFtuNz0wWnPclzo6p9vxnk"crossorigin="anonymous"></script>

</body>

</html>

GITHUB LINK:

https://github.com/IBM-EPBL/IBM-Project-20794-1659763443