IBM NALAIYA THIRAN 2022-23

PROJECT DOCUMENTATION

NATURALDISASTERSINTENSITYANALYSS AND CLASSIFICATION USING ARTIFICIAL INTELLIGENCE

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INTRODUCTION

There has been an unsettling rise in the intensity and frequency of natural disasters due to climate change and anthropogenic activities. Artificial intelligence (AI) models have shown remarkable success and superiority to handle huge and nonlinear data owing to their higher accuracy and efficiency, making them perfect tools for disaster monitoring and management.

PROJECT OVERVIEW

Natural Disasters are catastrophic events with atmospheric and historic origins (hurricanes, floods, tsunamis, earthquakes). That can cause fatalities, property damage and social environment disruption.

Natural disasters are the results of a hazard overwhelming highly vulnerable community,often resulting in mortality and morbidity.Over the past decade,over 300 natural disasters occur yearly around the world affecting millions and cost billions.The disaster cycle is a framework used to base a coordinated plan to respond,recover,prevent,and prepare for a disaster.Access to clean water,proper sanitation,food/nutrition,shelter,and the threat of communicable diseases are concerns that have potential to be detrimental to the management of a natural disaster,slowing the recovery process.

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

Basically the main objective of natural disaster management is to reduce the damage. However, there are several objectives that are integrated with it. Those are,

1. Identifying the hazard and its cause.

2. Reducing vulnerability and potential losses of hazard.

3. Assessing, reviewing and controlling the risk.

4. Applying efficient, effective, sustainable relief (food, shelter and money), medical and other facilities in disaster affected people thus they can survive.

5. Reducing the damage, death, sufferings and destruction of any natural and human induced disaster.

6. Giving protection to victims.

7. Increasing the strength among people to survive against disasters.

8. Building up capacity in every sector like- individual, social, economic, environmental, regional, national and international.

9. Ensuring the availability of local emergency equipment and transportation.

10.Promote the culture of disaster risk prevention and mitigation at all levels.

LITERATURE SURVEY

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 Pretrained model and the type of disaster is identified and showcased on the OpenCV window.

EXSISTING PROBLEM

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.

REFERENCES

[1] “Number of reported disasters by type.” [Online]. Available: https://ourworldindata.org/natural-disasters.

[2] Tuswadi and T. Hayashi, “Disaster Prevention Education in Merapi Volcano Area Primary Schools: Focusing on Students’ Perception and Teachers’ Performance,” Procedia Environ. Sci., vol. 20, pp. 668–677, 2014.

[3] “2015_43291_Sendaiframeworkfordrren_Disaster Reduction 2015-2030,” 2015.

[4] S. Goswami, S. Chakraborty, S. Ghosh, A. Chakrabarti, and B. Chakraborty, “A review on application of data mining techniques to combat natural disasters,” Ain Shams Eng. J., vol. 9, no. 3, pp. 365–378, 2018.

[5] I. A. T. Hashem, I. Yaqoob, N. B. Anuar, S. Mokhtar, A. Gani, and S. Ullah Khan, “The rise of ‘big data’ on cloud computing: Review and open research issues,” Inf. Syst., vol. 47, pp. 98–115, 2015.

[6] M. Yu, C. Yang, and Y. Li, “Big Data in Natural Disaster Management: A Review,” Geosciences, vol. 8, no. 5, p. 165, 2018.

[7] P. Sciences, “science direct,” 2018. [Online]. Available: https://www.sciencedirect.com/.

[8] Springer, “springeropen,” Technolo, 2018. [Online]. Available: https://www.springeropen.com/journals.

[9] IEEE, “IEEE,” 2018. [Online]. Available: http://ieeexplore.ieee.org.

[10] Google Scholar, “Google Scholar,” 2018. [Online]. Available: https://scholar.google.com/intl/en/scholar/about.html

PROBLEM STATEMENT DEFINITION

The purpose of the problem statement is to identify the issue that is a concern and focus it in a way that allows it to be studied in a systematic way. It defines the problem and proposes a way to research a solution, or demonstrates why further information is needed in order for a solution to become possible.

Problem Statement is inclusive of below answers:

1. Who does it affect/does not affect?
2. What does it affect/does not affect?
3. How does it affect/does not affect?
4. When is it a problem/is not a problem.
5. Where is it a problem/is not a problem.

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.

The natural disasters disturbs the ecosystem,both humans and animals.(WHO)

In a disaster, **you face the danger of death or physical injury**. You may also lose your home, possessions, and community. Such stressors place you at risk for emotional and physical health problems.(WHAT)

Wildlife can be killed by the force of the disaster or impacted indirectly through changes in habitat and food availability. Endangered species are especially vulnerable when habitat is destroyed. Water quality is impacted when sewage treatment facilities flood or debris enters reservoirs and waterways.(HOW)

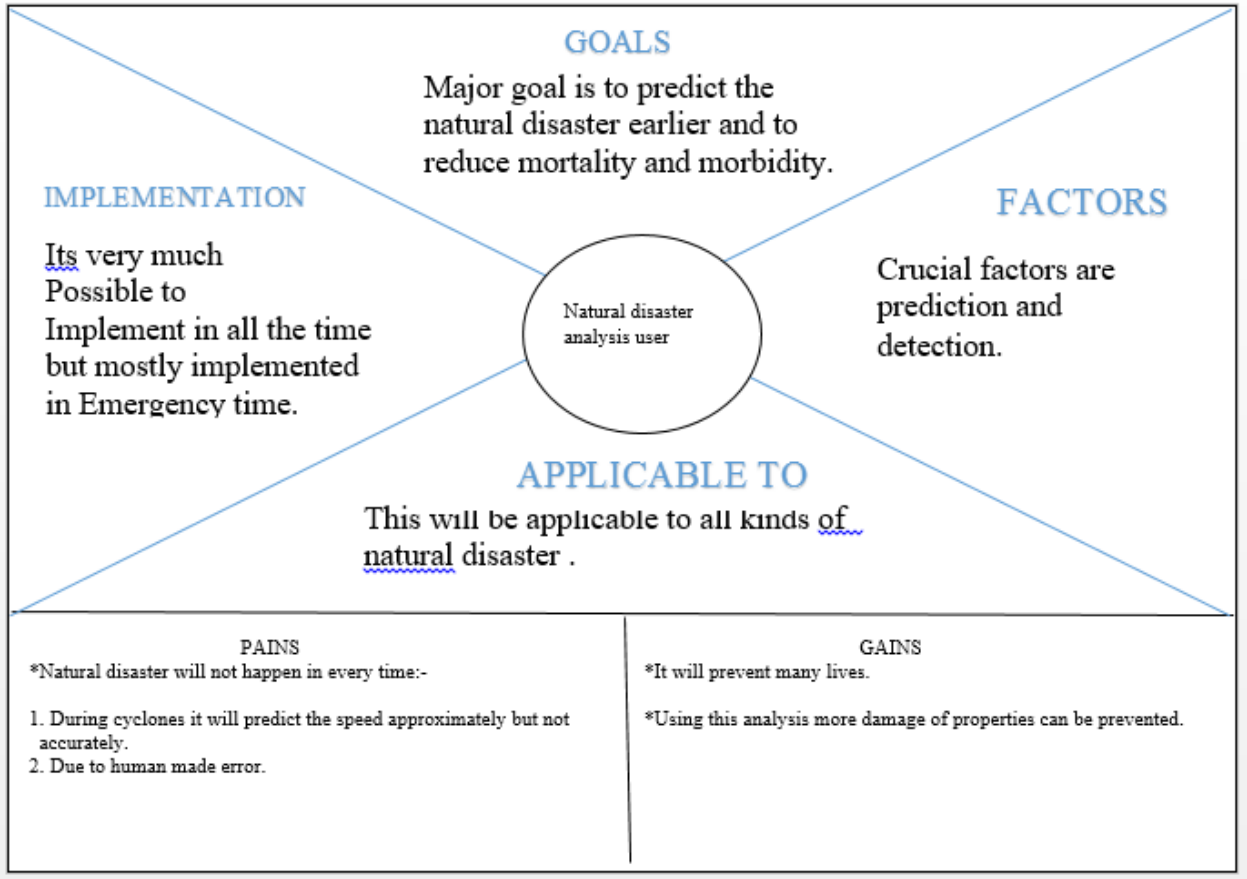
Natural disasters generally constitute an emergency since **they require immediate intervention due to their high impact on human health and safety**; they affect the normal functioning of working infrastructure, interrupting normal day activities and representing a risk for residents and workers in affected areas.(WHEN)

An area is defined as a hazard prone area **if the mortality risk is higher than a certain threshold**. A cyclone is defined as a wind storm with a maximum speed of more than 64 knots per hour. The definition includes typhoons and hurricanes.(WHERE)

Problem Statement(PS)	I am (customer)	I am trying to	But	Because	Which makes me feel
PS-1	An analyzer	Predict any natural disaster	It can only predict approximately Not accurately	Nature is uncertain	Abrupted
PS-2	User	User	Nature can do anything	Any problem can make any kind of disaster	Confused

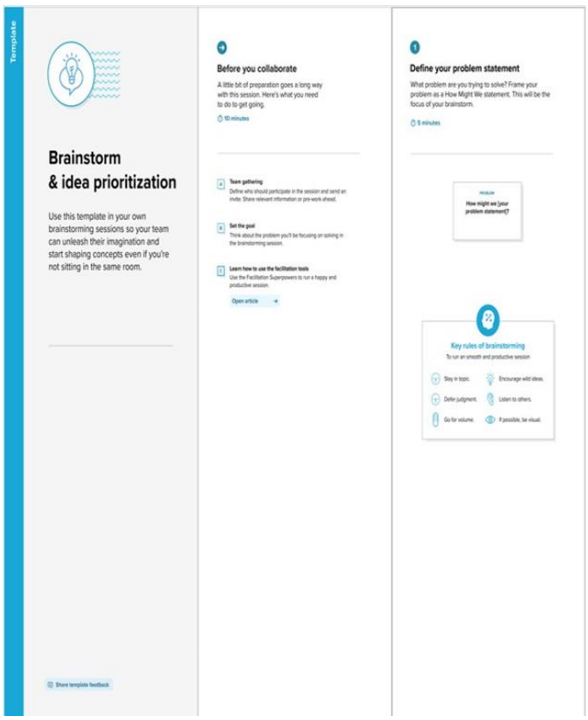
IDEATION AND PROPOSED SOLUTION

EMPATHY MAP CANVAS

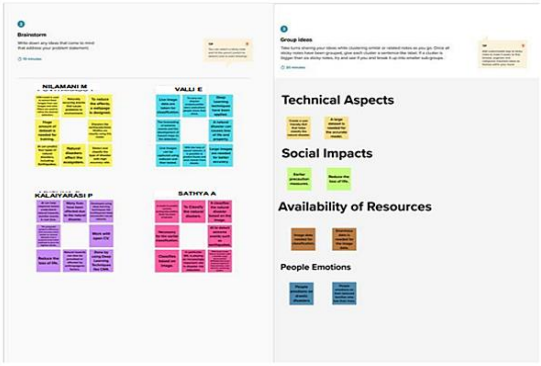


IDEATION AND BRAINSTORMING

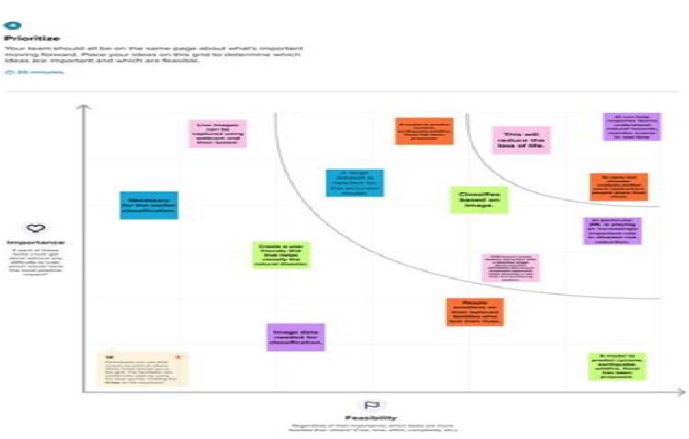
Step-1: Team Gathering, Collaboration and Select the Problem Statement



Step-2: Brainstorm, Idea Listing and Grouping



Step-3:Idea Prioritization



Cyclone intensity evaluation:

An application of state-of-art neuroevolution method can be developed for prediction of wind-intensity for tropical cyclones in the South Pacific region. The method employed data from cyclone wind-intensity taken for the last three decades. This employs Cooperative Coevolution method for training Elman recurrent neural networks for the prediction.

Flood intensity evaluation:

A hybrid deep learning based flood forecasting can be developed. This approach has been made use of daily lagged IF and precipitation time series data to determine flood situations at multiple forecast horizons. The practicality of the model can be tested using datasets from nine locations in Fiji.

Storm intensity evaluation:

A storm scale ensemble post-processing system based on ensemble machine learning algorithms, radar mosaic verification, and ensemble variable statistics can provide improved precipitation forecasts. Multiple machine learning models of varying complexity were applied to forecasts. Probabilistic, deterministic, and interval forecasts of 1-hour precipitation accumulation were created with the different models. Verification statistics showed that random forests, multiple logistic regression, and MARS provided significant improvements for probabilistic and continuous forecasts by both increasing the range of precipitation and probabilistic values predicted and by increasing the areal coverage of the precipitation forecasts.

PROPOSED SOLUTION

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	**Statement**-The natural disasters are unpredictable by human. **Description**: It is possible to classify the disasters based on their characteristics.
2.	Idea / Solution description	Some natural disasters can be forecasted based on past scientific data. Analyst look for patterns in data to determine where and when natural disasters are likely to occure , like tornadoes.

3.	Novelty / Uniqueness	It will not only analyse specifically on geologically but also atmospherically and hydrologicaly.
4.	Social Impact / Customer Satisfaction	Its not only about customer satisfaction is about the whole people in the regarding area they will be saved prior.
5.	Business Model (Revenue Model)	The artificial intelligently made system can be used by the user in the hill station to predict soil erosion and to the user based on their places.
6.	Scalability of the Solution	It can be used to test many times that one particular disaster with that specified measuring instruments with accuracy.

PROBLEM SOLUTION FIT

REQUIREMENT ANALYSIS

FUNCTIONAL REQUIREMENTS

Following are the functional requirements of the proposed solution.

FR No.	Functional Requirement(Epic)	Sub Requirement (Story / Sub-Task)
FR-1	Request Permission	Access permission from web camera.
FR-2	Disaster Prediction	Based on the webcam image, natural disaster isclassified.
FR-3	Accuracy	Since the training and testing images are huge, theaccuracy is higher.

FR-4	Speed	The generation of results from the input images arefaster.
FR-5	Resolution	The resolution of the integrated web camera shouldbe high enoughtocapture the videoframes.
FR-6	User Interface	Maximizing theinteraction in Web Designing Service.

NON FUNCTIONAL REQUIREMENTS

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

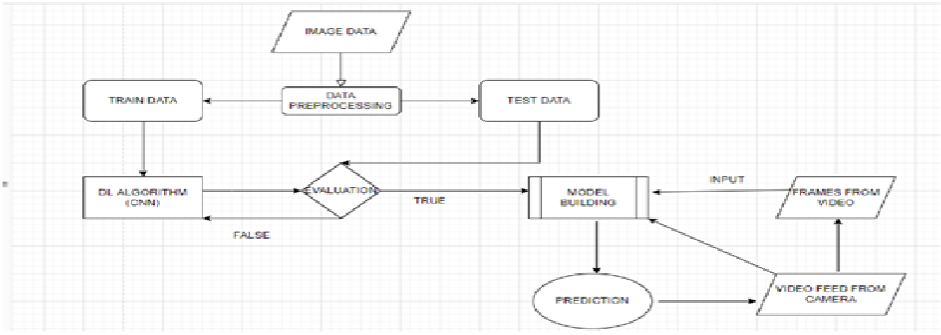
FR No.	**Non-FunctionalRequirement**	**Description**
NFR-1	Usability	User friendly and classify the disaster easily.
NFR-2	Security	The model is secure due to the cloud deployment models and also there is no loginissue.

NFR-3	Reliability	Accurate prediction of the natural disaster andthe websitecan also be fault tolerant.
NFR-4	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 theNDRF and customers.

PROJECT DESIGN

DATA FLOW DIAGRAM

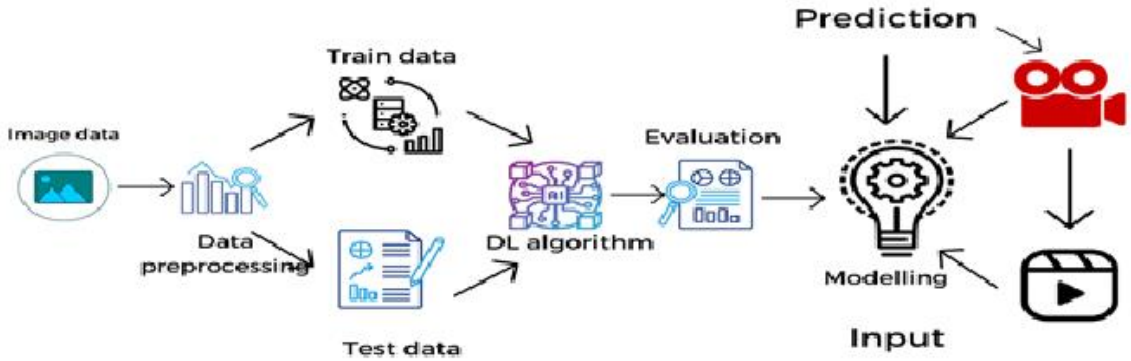
A Data Flow Diagram (DFD) is a traditional visual representation of the information flows within a system.A neat and clear DFD can depictthe right amount of the system requirement graphically.It shows how data understand leaves the system,what changes the information,where datas are stored.

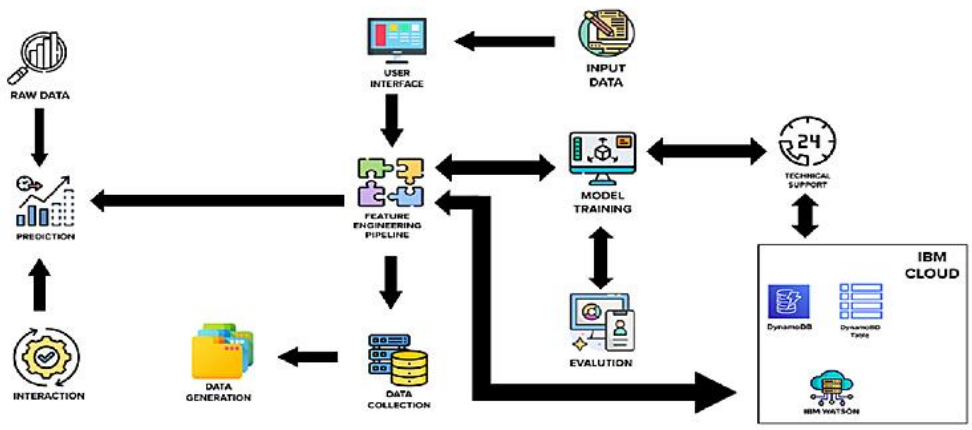


SOLUTION AND TECHNICAL ACRCHITECTURE

Architecture is a complex process – with many sub-processes – that bridges the gap between business Solution problems and technology solutions. Its goals are to:

1. Find the best tech solution to solve existing business problems.
2. Describe the structure, characteristics, behavior, and other aspects of the software to project stakeholders.
3. Define features, development phases, and solution requirements.Provide specifications according to which the solution is defined, managed, delivered.





Components & Technologies:

1. User Interface

Description

User interacts with the application for the prediction of Any Natural disaster which will happen in future minutes.

Technology

HTML, CSS, JavaScript, Django, Python.

2. Feature Engineering Pipeline

Description

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.

Technology

Image processing, pattern extraction, etc.

3. Model Training kit

Description

It learns patterns from the data. Then they use these patterns to perform particular tasks

Technology

Multiclass Classification Model, Regression Model, etc.

4. Prediction unit

Description

This function is used to predict outcomes from the new trained data to perform new tasks and solve new problems.

Technology

Decision trees, Regression, Neural networks.

5. Evaluation system

Description

It monitors that how Algorithm performs on data as well as during training

Technology

Chi-Square, Confusion Matrix, etc.

6. Interactive services

Description

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

Technology

Application programming interface, etc.

7. Data collection unit

Description

Data is only useful if it's accessible, so it needs to be stored ideally in a consistent structure and conveniently in one place.

Technology

IBM Cloud, SQL Server.

8. Data generation system

Description

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

Technology

Synthetic data generation.

9. Database management system

Description

An organized collection of data stored in a database, so that it can be easily accessed and managed.

Technology

MySQL, DynamoDB etc.

10. IBM Cloud services

Description

Processed data stored in cloud service which can be access by the admin anywhere over the internet.

Technology

IBM Cloud etc.

Application Characteristics:

1. Open-Source Frameworks

Description

An open source framework is a template for software development that is designed by a social network of software developers. These frameworks are free for public use and provide the foundation for building a software application.

Technology

Keras, tensor flow.

2. Authentication

Description

This keeps our models secure and makes sure only those who have permission can use them.

Technology

Encryption and Decryption (OTP).

3. Application interface

Description

User uses mobile application and web application to interact with model

Technology

Android and Web Development (PhoneGap, ReactNative, and NativeScript).

4. Availability (both Online and Offline work)

Description

It includes both online and offline work. A good internet connection is needed for online work to explore the software perfectly. Offline work includes the saved data to explore for later time.

Technology

Caching, backend server.

5. Regular Updates

Description

The truly excellent software product needs a continuous process of improvements and updates. Maintain your server and make sure that your content is always up-to-date. Regularly update an app and enrich it with new features.

Technology

1. Waterfall Approach
2. Incremental Approach
3. Spiral Approach

6. Personalization

Description

Software has features like flexible fonts, backgrounds settings, colour themes, etc. which make a software interface look good and functional.

Technology

1. HubSpot
2. Proof

USER STORIES

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Release
Customer (Mobile user)	Upload Data	USN-1	As a user, I can upload either a live stream, video or photo of the disaster	I can upload the data.	High	Sprint-1
Functional Requirement (Epic)	Obtain Output	USN-2	As a user, I can receive the classification and the intensity of the disaster	I can receive the information about the disaster	High	Sprint-1
Customer (Mobile user)	Upload Data	USN-1	As a user, I can upload either a live stream, video or photo of the disaster	I can upload the data.	High	Sprint-1
Customer (Mobile user)	Obtain Output	USN-1	As a user, I can receive the classification and the intensity of the disaster.	I can receive the information about the disaster	High	Sprint-1

PROJECT PLANNING AND SCHEDULING

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 mypassword.	2	High	Nilamani Sathiya Kalaiyarasi Valli
Sprint-1		USN-2	As a user, I will receive confirmation email once I have registered for the application	1	High	Nilamani
Sprint-2		USN-3	As a user, I canregister for the application through Facebook	2	Low	Valli
Sprint-2		USN-4	As a user, I canregister for the application through Gmail	2	Medium	Sathiya
Sprint-1	Login	USN-5	As a user, I can log into the application by enteringemail& password	1	High	Kalaiyarasi
Sprint-1	Dashboard	USN-6	As a user, I canaccess the services and information provided in the dashboard	2	High	Nilamani
Sprint-1	login	USN-7	As a user, I can log intothe web application andaccess the dashboard	2	High	Kalaiyarasi
Sprint-4	Helpdesk	USN-8	As a user, I canget the guidance from the customer care	1	High	Valli

SPRINT PLANNING AND ESTIMATION

Sprint-3	Management	USN-9	As an administrator, I can collect new datasets andkeep the model trained	2	High	Valli
Sprint-3		USN-10	As an administrator, I can update other features of the application	2	Medium	Sathiya
Sprint-3		USN-11	As an administrator, I can maintain the information about the user	2	Medium	Valli
Sprint-4		USN-12	As an administrator, I can maintain third-party services	1	Low	Kalaiyarasi

SPRINT DELIVERY SCHEDULE

Sprint	Total Story Points	Duration	Sprint Start Date	Sprint End Date(Planned)	Story Points Completed (as on Planned End Date)	Sprint Release Date (Actual)
Sprint-1	8	6 Days	26 Oct 2022	31 Oct 2022	8	5 Nov 2022
Sprint-2	4	6 Days	1 Oct 2022	05 Nov 2022	4	7 Nov 2022
Sprint-3	6	6 Days	6 Nov 2022	10 Nov 2022	6	13 Nov 2022
Sprint-4	2	6 Days	10 Nov 2022	13 Nov 2022	2	16 Nov 2022

CODING AND 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.

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

RESULTS

PERFORMANCE METRICS

S.No.	Parameter	Values(Percentage)
1.	Model Summary	-96%

2.	Accuracy	Training Accuracy - 96.5% Validation Accuracy -92.3%
3.	Confidence Score (Only Yolo Projects)	Class Detected - Nil Confidence Score - Nil

Our Project marks the successive performance by implementing in order to be cost effective and more reliable to use and to predict the future from the natural disaster that we are ahead of. The successive way includes the objectives, activities and the approaches for the project. It mainly includes the trained dataset which gives an excessive measure of success which helps to overcome the future from this natural disaster.

ADVANTAGES AND DISADVANTAGES

ADVANTAGES:

1. The use of AI to forecast natural disasters would save millions of lives. Furthermore, the information evaluated by AI-powered systems can aid in understanding the scale and patterns of natural catastrophes such as floods, earthquakes, and tsunamis, which would aid in improved infrastructure development in disaster-prone areas.

2. 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 emergency.

DISADVANTAGES:

1. A forest fire is a natural disaster that cannot be forecasted.

2. Sometimes the prediction may fail and result in huge loss.

CONCLUSION

Natural disasters inflict severe damage on almost the entire spectrum of social and natural habitats, ranging from housing and shelter, water, food, health, sanitation, and waste management to information and communication networks, supply of power and energy, and transportation infrastructure. The major challenges faced in all disasters include pre-disaster early warning infrastructure; the supply of food and clean drinking water; health and sanitation; information and communication; power and energy for lighting and cooking; waste collection and disposal, including rapid disposal of dead bodies of humans and animals; disaster-proof housing and shelter; emergency and post-disaster shelters; rescue and relief operations; and transport infrastructure. Though it is not possible to prevent most of the disasters, still their effects can be alleviated or mitigated in magnitude by anticipated preparedness. Advanced disaster management technology could provide a critical support system for disaster management authorities at times of disaster-related crises. Such a technology also provides important inputs for any disaster management plan of action in modern times. Communities and individuals have to be educated on pre-disaster planning and preparedness. Awareness must be created amongst masses, for which first-aid training at grass roots level is essential. There should be a National Disaster Plan that defines the tasks of the communities and local health personnel.

For the evaluation of the model ROC and 30% landslide point's residual was used. The results showed that the accuracy of the model was estimated by ANFIS in the study area of 77.48% (good accuracy); this data-mining method depends on the number of pairs of training, experimental and fuzzy data used in the research, and, in particular, by increasing the number of fuzzy rules of the process, more accurate simulation can be provided. So far, different methods have been proposed for landslide susceptibility zonation. The accuracy or the error of each of these methods, as well as the use and comparison of each of these methods, requires knowledge of the foundations on which the methods are based. So far, different approaches to landslide susceptibility zonation have been proposed, but what is certain is that all these methods can provide accurate results with minimal data and costs and at very low levels. Combining these models with GIS and RS systems not only increases the accuracy of dealing with complex issues and uncertainties, but also leads to the emergence and development of new theories and methods in a variety of issues.

FUTURE SCOPE

The term "Natural Disaster" encompasses the complete realm of disaster-related activities. Traditionally people tend to think of disaster management only in

terms of the post-disaster actions taken by relief and reconstruction officials; yet disaster management covers a much broader scope, and many modern disaster managers may find themselves far more involved in pre-disaster activities than in post-disaster response. Those are:

1. The refugee field of disaster management is highly specialized and requires not only many development skills but also a broader awareness of political, legal, and humanitarian issues.

2. DM aims and objectives, elements, Natural/man-made Disasters, Victims, Relief Systems.

3. Phases of Disaster Response/Relief Operations, Government's Role.

To Safeguard and make available vital materials, supplies and equipment to ensure the safety and recovery of records from predictable disasters.To reduce the risk of disasters caused by human error, deliberate destruction, and building or equipment failures. Be better prepared to recover from a major natural catastrophe.

In this project we help to build preparedness for threats and hazards by providing a low-risk, cost-effective environment to: **Test and validate plans, policies, procedures and capabilities**. Identify resource requirements, capability gaps, strengths, areas for improvement, and potential best practices.

Disaster management aims to reduce, or avoid, the potential losses from hazards, assure prompt and appropriate assistance to victims of disaster, and achieve rapid and effective recovery. Disaster Risk Management includes the sum total of all activities, programmes and measures which can be taken up before, during and after a disaster with the purpose to avoid a disaster, reduce its impact or recover from its losses.

APPENDIX

Source Code

home.html:

```
 <!DOCTYPE html>
<html lang="en">
<head>
```

```
    <meta charset="UTF-8">
    <meta http-equiv="X-UA-Compatible" content="IE=edge">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <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>Nalaiya Thiran</title>
</head>
<body>
    <div class="card text-center">
        <div class="card-header">
          <ul class="nav nav-tabs card-header-tabs">
            <li class="nav-item">
              <a class="nav-link active" aria-current="true" href="home.html"
style="font-size: 24px;">Home</a>
            </li>
            <li class="nav-item">
              <a class="nav-link" href="intro.html" style="font-size:
24px;">Introduction</a>
            </li>
            <li class="nav-item">
              <a class="nav-link" href="upload.html" style="font-size:
24px;">Upload</a>
            </li>
          </ul>
          <h3 style="float: right;">Natural Disaster Analysis using AI</h3>
        </div>
      </div>
      <div class = "container" style="text-align: center;">
      <div class="card" style="width: 18rem; padding: 10px; margin: 40px;
margin-left: 40px;display:inline-block">
        <img class="card-img-top" src="{{ url_for('static',
filename='cyclone.jpg') }}" alt="Card image cap">
        <div class="card-body" >
          <h5 class="card-title">Cyclone</h5>
          <p class="card-text">Cyclones are large revolving tropical storms
caused by winds blowing around a central area of low atmospheric pressure.</p>
          <a href="https://en.wikipedia.org/wiki/Cyclone" class="btn btn-
primary">Know more</a>
        </div>
      </div>
      <div class="card" style="width: 18rem; padding: 10px; margin: 40px;
margin-left: 40px;display:inline-block">
        <img class="card-img-top" src="{{ url_for('static',
filename='earthquake.jpg') }}" alt="Card image cap">
        <div class="card-body" >
          <h5 class="card-title">Earthquake</h5>
          <p class="card-text">An earthquake is what happens when two blocks
of the earth suddenly slip past one another. The surface where they slip is
called the fault or fault plane.</p>
```

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

</html>
```

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>Nalaiya Thiran</title>
</head>
<body>
    <div class="card text-center">
        <div class="card-header">
          <ul class="nav nav-tabs card-header-tabs">
            <li class="nav-item">
              <a class="nav-link" 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;">Natural Disaster Analysis using AI</h3>
        </div>
      </div>
      <h2 style="padding: 50px; margin: 50px; word-spacing: 15px; text-align:
justify ;line-height: 1.6;">
        India, China and the United States of America 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 objective of the project is to 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 User Interface.
      </h2>
</body>
</html>
```

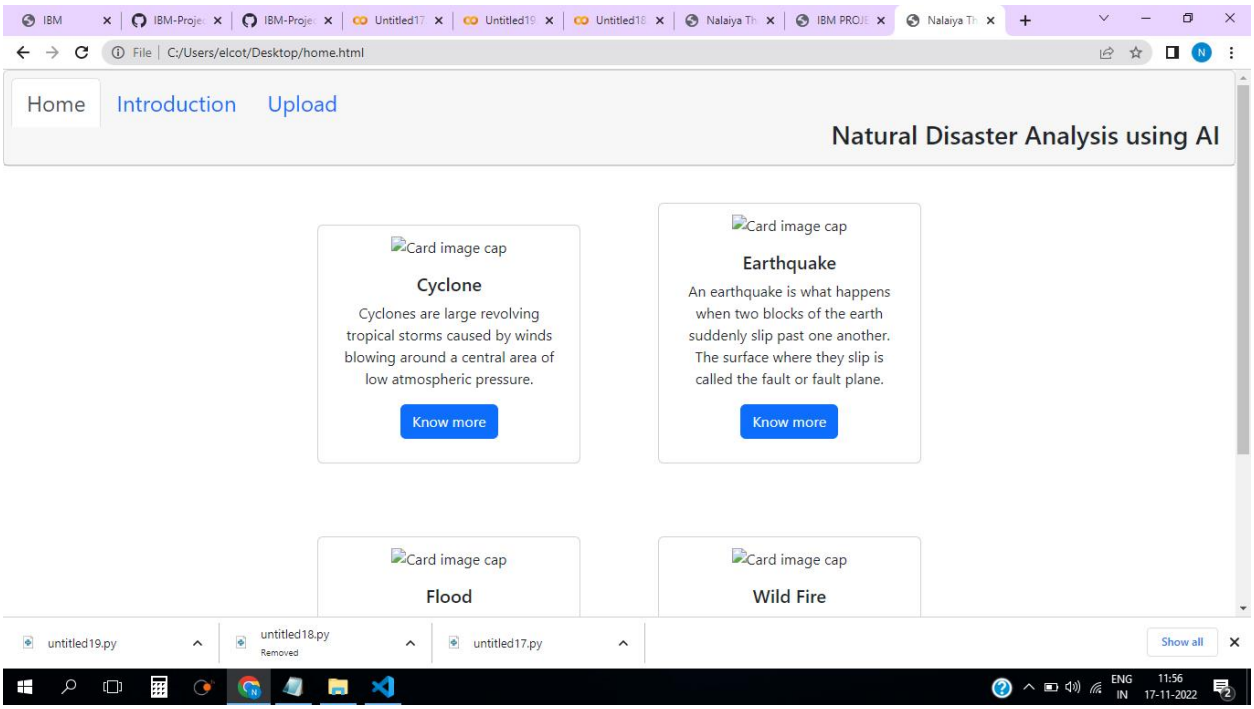
upload.html:

```
<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-
```

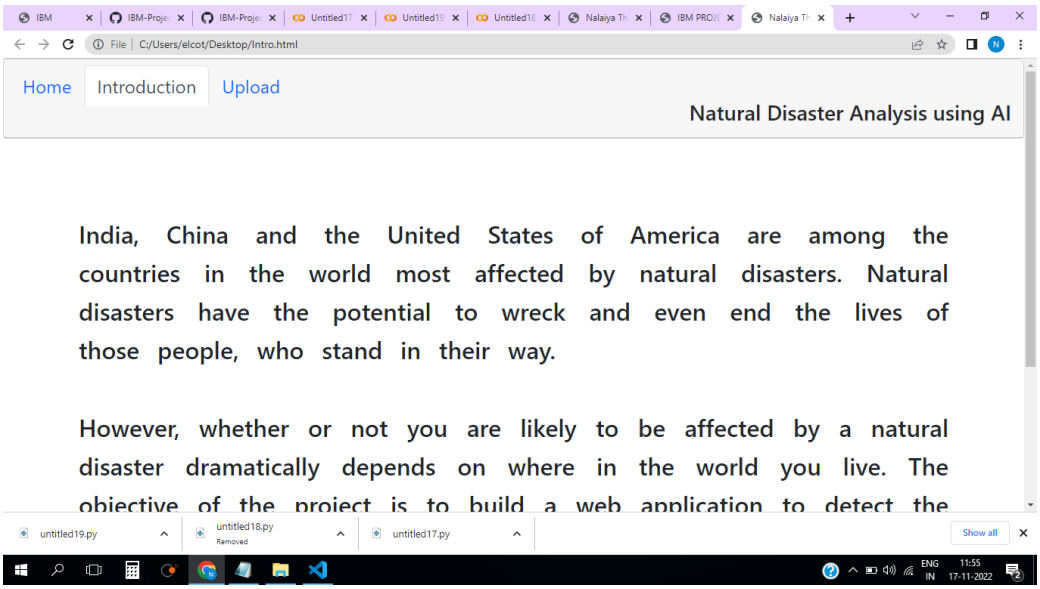
```
Zenh87qX5JnK2Jl0vWa8Ck2rdkQ2Bzep5IDxbcnCeuOxjzrPF/et3URy9Bv1WTRi"
crossorigin="anonymous">
    <title>Nalaiya Thiran</title>
</head>
<body>
    <div class="card text-center">
        <div class="card-header">
          <ul class="nav nav-tabs card-header-tabs">
            <li class="nav-item">
              <a class="nav-link" 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>
```

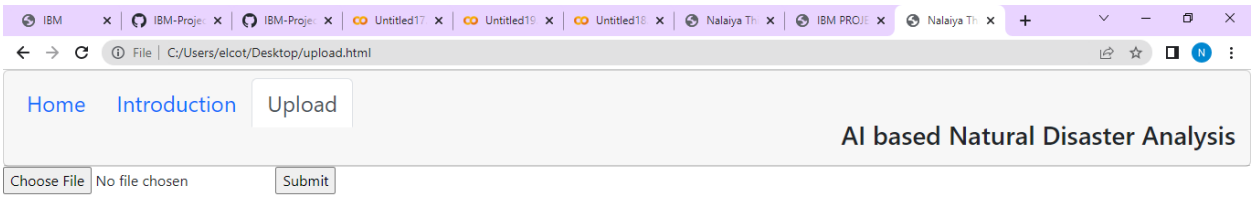
Home.html


File | C:/Users/elcot/Desktop/home.html
Home
Introduction
Upload
Natural Disaster Analysis using AI
Card image cap
Cyclone
Cyclones are large revolving tropical storms caused by winds blowing around a central area of low atmospheric pressure.
Know more
Card image cap
Earthquake
An earthquake is what happens when two blocks of the earth suddenly slip past one another. The surface where they slip is called the fault or fault plane.
Know more
Card image cap
Flood
Card image cap
Wild Fire
untitled19.py
untitled18.py
Removed
untitled17.py
Show all
ENG
IN
11:56
17-11-2022

Intro.html:



Upload.html:



GITHUB LINK:https://github.com/IBM-EPBL/IBM-Project-52646-1661059024

DEMO LINK

https://drive.google.com/file/d/1gOBZNZKMm8g4qwuvqxWqDNCkwG22KiVa/view?usp=drivesdk