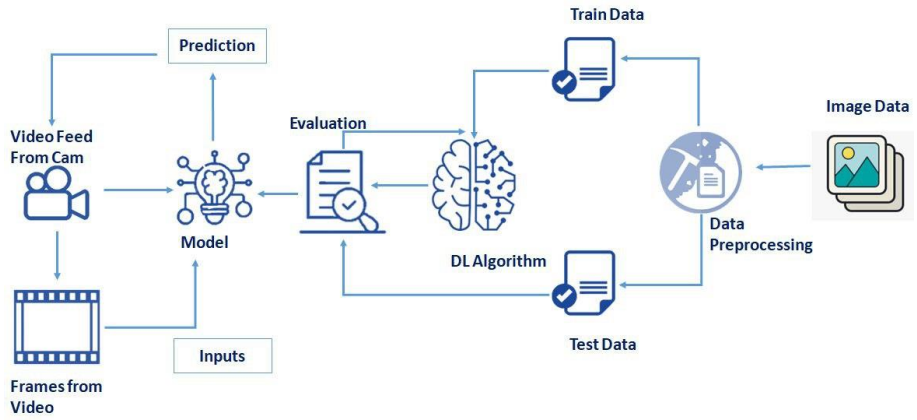
Project Design Phase-II
Technology Stack (Architecture & Stack)

Date	03 October 2022
Team ID	PNT2022TMID13948
Project Name	Natural disasters Intensity Analysis and Classification Using Artificial Intelligence
Maximum Marks	4 Marks

Technical Architecture



- **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.**

Table-1 : Components & Technologies:

S.No	Component	Description	Technology
1.	Rainfall data, slope, elevation data, flow accumulation, soil, land use, and geology data layers	Flood vulnerability mapping and plotting	Artificial neural network
2.	Satellite spatial images and field survey data	Landslide disaster exposure mapping	RFEs and NBT classifiers
3.	Satellite spatial images	Landslide and flood disaster risk reduction	CNN
4.	Social media application and satellite images	**Disaster risk reduction through social media**	CNN, SVM, RFS, and GVN networks
5.	Social media application and satellite images	Flood prediction by satellite images	CNN, SVM, RFS, and GVN networks
6.	Satellite images	Disaster assessment in coordinating relief (flood and fire management)	CNN and semantic segmentation models of satellite images
7.	3D point cloud	Earthquake prediction detection	CNN networks
8.	Satellite and UAV images	Classification of building damages (earthquake)	CNN networks
9.	UAV images	Near real-time damage mapping	CNN networks
10.	Satellite images	Post-earthquake damage mapping	ANN (the backpropagation algorithm) and support vector machines (radial basis function, RBF)

Table-2: Application Characteristics:

S.No	Characteristics	Description	Technology
1.	Simulated annealing	Assess impact, Develop post -event recovery plan	DRL
2.	Q-Learning	Understand people's concern ,emotion and reaction.	Deep Learning
3.	Linear regression non-Linear regression	Early warning/alert system	Supervised models
4.	Hierarchical clustering	Disaster information system and inter-agency collaboration	Technology used
5.	Recurrent neural network	Track recovery	Technology used