Ideation Phase
Literature Survey

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Project Name	Project – Natural Disaster Intensity Analysis and Classification Using Artificial Intelligence
Maximum Marks	2 Marks

Literature Survey for the project "Natural Disaster Intensity Analysis and Classification Using Artificial Intelligence"

ABSTRACT

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.

Keywords: Natural Disaster, Losses, Ecosystems, CNN, OpenCV

LITERATURE SURVEY

S. No	Paper Title	Idea	Advantages	Disadvantages
1.	Natural Disasters Intensity Analysis and Classification Based on Multispectral	Block-I convolutional neural network (B-I CNN), for detection and occurrence of disasters Block-II	Easier and accurate calculation of Multispectral images	Takes time since it deals with a lot of images.

	Images Using Multi-Layered Deep Convolutional Neural Network	convolutional neural network (B-II CNN), for classification of natural disaster intensity types with different filters and parameters		
2.	Tropical Cyclone Intensity Estimation Using Multidimensional Convolutional Neural Network From Multichannel Satellite Imagery	Deep learning model called 3DAttentionTCNet is created, which is inspired by AlexNet. The pooling layer compresses some important information resulting in the loss of some intensity features, we remove the pooling layers	Accurate estimation of TC intensity is important to theoretical research studies and practical applications when compared to models like CNN.	Since 3DAttentionTCNet is a deep learning model, the amount of data needed to train the model is huge.
3.	Designing Deep-Based Learning Flood Forecast Model With ConvLSTM Hybrid Algorithm	A robust mathematical tool used to determine the flood state at a particular time for a given area is the Flood Index (IF) A model is developed using ConvLSTM, as an objective model, with alternative methods of LSTM, CNN-LSTM and SVR that can also determine the flood state	Early detection of natural disasters such as floods can greatly assist humans in reducing the extent of the damage caused by such events. The accuracy is high when compared to other models.	Since model developed using ConvLSTM is a deep learning model, the amount of data needed to train the model is huge and also time and processor consuming.
4.	A Conformal Regressor With Random Forests for Tropical Cyclone Intensity Estimation	A multiple linear regression (MLR) model was constructed based on the extraction of the most significant	It is considered an excellent way to extract features from satellite images to estimate TC	The MLR regression technique is exactly not suitable for all the scenarios of images.

		signals and parameters from satellite infrared images.	intensity. The Dvorak technique tried to estimate the TC intensity using visible or infrared images based on the cloud structure	
5.	Rainformer: Features Extraction Balanced Network for Radar-Based Precipitation Nowcasting	Framework: Rainformer Rainformer consists of an encoder (green box) and decoder (blue box). They both have four stages. When the stage goes deeper, the feature size becomes smaller. Both encoder and decoder include FEBM. FEBM enhances the low to medium and highintensity rainfall features at every stage.	It can extract global and local features from radar echo maps separately, and fuses balanced these two features to enhance the model's ability to predict heavy rain or rainstorm.	The Rainformer model is processor complex and also the encoding may not be very efficient.
6.	Quantifying change after natural disasters to estimate infrastructure damage with mobile phone data	It indicates that how mobility patterns are changing, in the post disaster timeframe, is crucial in order to settle rescue centers and send help to the most affected areas. We describe the approach taken to work with aggregated CDR data	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.	The mobile phone data is sometimes not sufficient for better quantification.

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