Project flow

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Team id	PNT2022TMID19551
Project Name	Natural Disaster Intensity Analysis and Classification Using Artificial Intelligence

Natural disasters intensity analysis and classification based on multispectral images using multi-layered deep convolutional neural network

- 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 model is tested on 4428 natural images and performance is calculated and expressed as different statistical values: sensitivity (SE), 97.54%; specificity (SP), 98.22%; accuracy rate (AR), 99.92%; precision (PRE), 97.79%; and F1-score (F1), 97.97%.

To accomplish this, we have to complete all the activities and tasks listed below

- Data Collection - data collection is the process of gathering, measuring, and analysing accurate data from a variety of relevant sources to find answers to research problems, answer questions, evaluate outcomes, and forecast trends and probabilities. ⬜ Collect the dataset or create the dataset.

- Image Pre-processing - Image processing is a method to perform some operations on an image, in order to get an enhanced image or to extract some useful information from it.

- Import Image Data Generator Library.
- Define the parameters /arguments for Image Data Generator class ⬚ Applying Image Data Generator on trainset and test set.

- Model Building

- Import the model building Libraries

- Initializing the model

- Adding CNN Layers

- Adding Hidden Layer

- Adding Output Layer

- Configure the Learning Process

- Training and testing the model

- Optimize the Model

- Save the Model

- Video Streaming and alerting

- OpenCV for video processing ⬚ Creating an account in Twilio service ⬚ Use Twilio API to send messages.