Date	25.10.2022
Team ID	PNT2022TMID39135
Project Name	Natural Disaster Intensity Analysis and Classification Using Artificial Intelligence
Maximum Marks	2 Marks

PROJECT DESCRIPTION:

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 multi-layered 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.

SURVEY:

PAPER-01:

NAME:

Natural Disasters Intensity Analysis and Classification Based on Multispectral Images Using Multi-Layered Deep Convolutional Neural Network.

WORK:

Deep learning, natural disasters intensity and classification, convolutional neural network.

LINK: https://www. researchgate. net/publicatio n/350830884 _Natural_Dis asters_Intens ity_Analysis_ and_Classific ation_Based_ on_Multispec tral_Images_ Using_Multi-L ayered_Deep_Convolution al_Neural_Network.

TOOLS FOR ALOGRITHM:

Convolutional Neural Network **FINDINGS:**

The proposed model works in two blocks: Block-I convolutional neural network (B-I CNN), for detection and occurrence of disasters, and Block-II convolutional neural network (B-II CNN), for classification of natural disaster intensity types with different filters and parameters.

PAPER-02:

NAME:

Recent Efforts in Earthquake Prediction(1990–2007) Ashif Panakkat and Hojjat Adeli.

WORK:

Data collection, Seismicity, Mathematical predication.

LINK:

https://www. researchgate. net/publication /248880503 _Recent_Efforts_in_Earthq uake_Predicti on_1990-2007

FINDINGS:

The most significant recent efforts in predicting the three earthquake parameters, namely, the time of occurrence, epicentral location, and the magnitude of future earthquakes are reviewed. Prediction studies can be broadly grouped based on the basic approach, which vary from purely theoretical geophysics, to genetic mutations and biology, to statistical, mathematical, and computational modelling of earthquake parameter data recorded in historical catalogs of seismic regions. The papers reviewed in this article are classified into two groups: (1) studies based on recording and analyzing earthquake precursors (seismic monitoring); and (2) studies based on historic earthquake data analysis.

PAPER-03:

NAME:

UAV Image-based Forest Fire Detection Approach Using Convolutional Neural Network

WORK:

Wildfire detection; fire classification on; fire segmentation; vision transformers; UAV; aerial image

LINK:

https://www. researchgate. net/publication /335865644 _UAV_Image based_Forest_Fire_Detection_Approach _Using_Convolutional_Neural_Network

TOOLS FOR ALOGRITHM:

Convolutional Neural Network

FINDINGS:

EfficientNet-B5 and DenseNet-201 models, is proposed to identify and classify wildfire using aerial images. In addition, two vision transformers (Transnet and Trans Fire) and a deep convolutional model (EfficientSeg) were employed to segment wildfire regions and determine the precise fire regions.

PAPER-04:

NAME:

UAVs in Disaster Management: Application of Integrated Aerial Imagery and Convolutional Neural Network for Flood Detection

Authors:

Afiz Suliman Munawar**,** Fahim Ullah**,** Siddra Qayyum**,** Sara Imran Khan**,** Mohammad Mojtahedi

WORK:

Convolutional neural network (CNN); Disaster management; aerial imagery; flood detection; Unmanned aerial vehicles (UAVs)

LINK:

https://www. researchgate.net/publication/353015053 _UAVs_in_Disaster_Management_Application_of_Integrated_Aerial_Imagery_ and_Convolutional_Neural_Network_for_ Flood_Detection

TOOLS FOR ALOGRITHM:

Convolutional Neural Network **FINDINGS:**

For training phase, 2150 image patches are created by resizing and cropping source images. These patches in training dataset train CNN model to detect and extract the regions where a flood related change has occurred. This model is tested against both pre and post disaster images to validate it .0 highlights the occurrence of a disaster, whereas 1 represents no disaster

PAPER-05:

NAME:

Current efforts for prediction and assessment of natural disasters: Earthquakes, tsunamis, volcanic eruptions, hurricanes, tornados and floods **AUTHOR:**

P. AMezquita-Sanc
M.Valtierra-Rodriguez,
H. Adeli

WORK:

Big Data Prediction

LINK:

https://www.magiran.com/paper/1779408/?lang=en

FINDINGS:

Signal and image processing techniques and statistical analyses used for prediction and assessment