Natural Disaster Intensity Analysis and Classification using Artificial Intelligence

Problem Solution

Architecture

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Introduction:

Natural Disaster:

Natural disasters are inevitable, and the occurrence of disasters drastically affects the economy, ecosystem and human life. Buildings collapse, ailments spread and sometimes natural disasters such as tsunamis, earthquakes, and forest fires can devastate nations. When earthquakes occur, millions of buildings collapse due to seismological effects [1]. Many machine learning approaches have been used for wildfire predictions since the 1990s. A recent study used a machine learning approach in Italy. This study used the random forest technique for susceptibility mapping of wildfire [2]. Floods are the most devastating natural disaster, damaging properties, human lives and infrastructures. To map flood susceptibility, an assembled machine learning technique based on random forest (RF), random subspace (RS) and support vector machine (SVM) was used [3]. As the population is growing rapidly, people need to acquire land to live on, and as a result the ecosystem is disturbed horrifically, which causes global warming and increases the number of natural disasters. Populations in underdeveloped countries cannot afford damages disasters cause to infrastructures. The aftermath of disasters leaves the humans in miserable situations, and sometimes the devastating effects cannot be detected; additionally, rescue operations cannot take place in most of the places and victims are unable to be identified due to geographical factors of the different areas. Disasters such as forest fires spread rapidly in dense areas, so firefighting is difficult to carry out; in this case, development of the

strategy to predict such circumstances is crucial so that such disasters can be prevented beforehand.

As the technologies are continuously improving, aviation systems have begun adopting smart technologies to develop unmanned aerial vehicles (UAVs) equipped with cameras, which can reach distant areas to identify aftereffects of natural disasters on human life, infrastructure, and transmission lines by capturing images and videos. Data acquired from these UAVs helps to identify the facial expressions of victims, the intensity of their situation and their needs in a post disaster scenario. It helps to take actions and carry out necessary operations to tackle devastating scenarios. Raw images obtained from camera-equipped UAVs are processed and neural network-based feature extraction techniques are applied to analyse the intensity.

Problem Statement:

Vasu is a civilian and he is living in a seashore area. He is unaware about climatic and status of water level in seashore area.

So, Vasu using an artificial technology to know the current status of the climatic conditions at anywhere, any situations.

Solution Architecture:

- ➢ A network less\issues area we can provide an offline facility.
- ➢ Our application\website not only provide risk alert to normal civilians. Also, we provide some of the suggestions to peoples that, what can do in those critical solutions, suggest some safe nearby areas.
- ➢ We also provide those civilians understood able languages and easy user interface.
- ➢ We should provide proper climatic situations alerts.
- ➢ We also share the hazardous area's locations to the rescue department and also inform to the hospital management.
- ➢ We also include the facilities that user can also should give the situation in his\her living areas in that disaster occurred.
- ➢ We provide another facility that is the user can interact with the weather analysists and International Rescue committee.

Reliability:

★ Some of the civilians can live on network coverage less areas in that situation we can provide some of the offline facilities for what kind of actions they do.

★ Some of the civilians may be illiterate, so we will try to provide an effective user interface.

★ If any civilian can be needed for help, he\she will contact our application\website we will send that request to that nearby rescue department or voluntary team to provide some considerable help.

Usability:

➢ Civilians can protect their lives and valuable documents.

➢ People can know nearby safe areas.

➢ Civilians can know what kind of disaster can occur.

➢ Civilians can also know what kind of actions they do in those critical situations.

Design:

Natural Disaster System Architecture: