

**Project Design Phase-II**  
**Solution Requirements (Functional & Non-functional)**

Date	20 November 2022
Team ID	PNT2022TMID51308
Project Name	Natural Disasters Intensity Analysis and Classification using Artificial Intelligence
Maximum Marks	4 Marks

**Functional Requirements:**

Following are the functional requirements of the proposed solution.

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	User Discovery	The specification defines the services provided by the application service in AI system, referred to as common service function. The multilayered deep convolutional neural network for detection and intensity classification of natural disasters.
FR-2	Resource management	The proposed method works in two blocks—one for detection of natural disaster occurrence and the second block is used to remove imbalanced class issues. The results were calculated as average statistical values: sensitivity, 97.54%; specificity, 98.22%; accuracy rate, 99.92%; precision, 97.79%; and F1-score, 97.97% for the proposed model.
FR-3	Data management	They classify the natural disaster and tell 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.
FR-4	Event management	The proposed multilayered deep convolutional neural network method works in two blocks of convolutional neural networks. The first block, known as Block-I Convolutional Neural Network (B-I CNN), detects the occurrence of a natural disaster and the second one, known as Block-II Convolutional Neural Network (B-II CNN), defines the intensity of the natural disaster. Additionally, the first block consists of three mini convolutional blocks with four layers each and includes an image input and fully connected layers. On the other hand, the second block also consists of three mini convolutional blocks with two layers each, including an image input layer and fully connected layer.

### Non-functional Requirements:

Following are the non-functional requirements of the proposed solution.

FR No.	Non-Functional Requirement	Description
NFR-1	<b>Usability</b>	multilayered deep convolutional neural network model allows 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.
NFR-2	<b>Security</b>	Security is very critical requirement in AI solutions and defines its security framework including identification, authorization and authentication. Our middleware platform can be registered to the server as an application entity. It can attempt to access a list of authorized resources hosted by the server with its server-generated unique identifier and privileges, called access control policy. However, authentication and other security components such as certificates still remain incomplete
NFR-3	<b>Reliability</b>	we have not yet realized capabilities related to Reliability, which allows platform-equipped devices to adapt themselves according to short-term or long-term changes in resource conditions, application scenarios, and surrounding environments, remaining our future work.
NFR-4	<b>Performance</b>	This requirement belongs to a part of intelligence for AI devices, 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
NFR-5	<b>Availability</b>	Availability could be achieved by ensuring some level of fault-tolerance. A deep learning method for the reconstruction of two-dimensional cardiac magnetic resonance images was proposed to enhance the image data acquisition process. Cascade deep convolutional neural networks use a 10-fold method to reconstruct the feature map for the MR images. In this way,

		feature extraction sequence becomes very fast and it takes less than 5 to 10 s to extract the feature matrix
NFR-6	<b>Scalability</b>	<p>Scalable AI pertains to how data models, infrastructures, and algorithms are able to increase or decrease their complexity, speed, or size at scale in order to best handle the requirements of the situation at hand.</p> <p>As improvements continue with data storage capacities as well as computing resources, AI models can be created with billions of parameters. These AI models are used to address complicated, large-scope problems, everything from monitoring disease outbreaks during pandemics to tackling online bullying threats. It's extremely helpful for extracting value from large data sets and spotting patterns or trends that would be difficult or impossible for a human to notice.</p>