

## Project Design Phase-I

### Proposed Solution

<b>Date</b>	19.09.2022
<b>Team ID</b>	PNT2022TMID10120
<b>Project Name</b>	Natural Disasters Intensity Analysis and Classification Using Artificial Intelligence
<b>Maximum Marks</b>	2 Marks

#### Proposed Solution:

<b>S.No.</b>	<b>Parameter</b>	<b>Description</b>
1.	Proposed Statement (Problem to be solved)	<p>The main purpose of this model is to detect and classify the type of disaster with a high accuracy rate.</p> <p>To prevent natural disasters in the future, said model can be used to predict future disasters and take some action against heavy loss of human ecological systems and property</p>
2.	Idea / Solution Description	<p>We propose a multilayered deep convolutional neural network. The proposed model works in two blocks:</p> <ul style="list-style-type: none"><li>• Block-I convolutional neural network (B-I CNN), for detection and occurrence of disasters</li><li>• Block-II convolutional neural network (B-II CNN), for classification of natural disasters intensity types with different filters and parameters.</li></ul>
3.	Novelty / Uniqueness	<p>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.</p> <p>To address these problems, we proposed multilayered deep convolutional neural net-work for detection and intensity classification of natural disasters. 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.</p>

4.	Social Impact / Customer Satisfaction	Buildings collapse, ailments spread and sometimes natural disasters such as tsunamis, earthquakes, and forest fires can devastate nations. 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.
5.	Business Model (Revenue Model)	The proposed multilayered deep convolutional neural network was simulated on the computer system with Core i7, Central Processing Unit (CPU) 2.8 Ghz with 16 GB RAM in MATLAB 2018a and different types of results were calculated.
6.	Scalability of the solution	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.