

Project Design Phase-I Proposed Solution Template

Date	04 November 2022
Team ID	PNT2022TMID17130
Project Name	Emerging Methods for Early Detection of Forest Fires
Maximum Marks	2 Marks

Proposed Solution Template:

Project team shall fill the following information in proposed solution template.

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	Forest fires are considered as one of the most widespread hazards in a forested landscape. They have a serious threat to forest and its flora and fauna. Unplanned and abrupt forest fires are a major cause of forest degradation, while a controlled fire to manage and check the spread of unwanted forest fires serves as the action to improve the forest. So therefore, we've to detect prevention measure which should be taken to identify the fire prone areas and the tools which needed to be developed to minimize the loss and as well as implement forest fire committee to work for the reduction of damage caused. A forest fire risk prediction algorithm, based on support vector machines, is presented. The algorithm depends on previous weather conditions in order to predict the fire hazard level of a day.
2.	Idea / Solution description	Our solution aims at collecting the vast range of dataset to test and train the model regularly by using CNN where the system can detect immediately if any ignition of fire is found, where the video can be surveyed by satellite. Then Cloudant DB is brought to use where the large amount of data is stored and fetched which acts as a server. Open CV acts as a tool for processing videos which are captured. To send alerts to forest committee Twilio API is used where alerts are passed on detection. Watson Assistant also a chatbot tool which can help you monitor if any guide is needed.
3.	Novelty / Uniqueness	Existing system uses electronic sensors to detect forest fire and smoke. The change in temperature indicates the presence of forest fire and smoke in a region which can be detected by the sensors using radiation heat. As forests are in remote area it's difficult for installation and maintenance of sensors. Our proposed system depends on using AI to make it cheaper and easier for the forest management. Accuracy and timely prediction using AI, CNN and API made it possible.
4.	Social Impact / Customer Satisfaction	Forest fires are dangerous for the existence of life as they carry wildlife and natural resources which gives life to various living bodies. Thus, fires are occurred expectedly or unexpectedly which has to be prevented as earlier as we can. Therefore, forest management should be active enough to be aware and keeping an eye to check the forest fields regularly. As, what we save, saves us should be the

		Social awareness to be brought to the people. The proposed solution meets the customer satisfaction needs as it Provides immediate alerts as soon as any fire is spotted which helps the forest committee to take actions sooner.
5.	Business Model (Revenue Model)	A working model which gets the live captures from satellite needed to be implemented, where the camera can monitor continuously the forest area and a working trained model which can automatically show up if any spark, fire or smoke is detected. The model has to be trained widely using large datasets which can be fed into databases and feedbacks can be retrieved. Thus, video processing is the main motive for detection of forest fires, and then forest management team should be present to monitor the live video and to get ready to prevent fire from further extension if any alert is produced from the trained model. Thus, this proposed model can be implanted at fire-prone area to provide quick responses and practice prevention methods.
6.	Scalability of the Solution	The device should be compatible with a minimum of 4GB RAM to support usage of various software like Anaconda Navigator for python and data science. Testing and training undergo using latest technology like Tensor Flow and Keras . Importantly satellite needed to be accessed repeatedly via camera and the data generated have to be processed by Open CV and further it should be connected with a alerting system and a messaging interface to send notifications.